

Oribatids from Madagascar II. (Acari: Oribatida).
(New and interesting mites from the Geneva Museum LXXIX.)

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Oribatids from Madagascar II (Acari: Oribatida). – Seventeen species are listed, fifteen of them are new to science. Six new genera are established, one in the family *Otocepheidae* (*Didierotocepheus* gen. n.), four in the family *Oppiidae* (*Lemuropia* gen. n., *Pustuloppia* gen. n., *Radamoppia* gen. n. and *Fossoppia* gen. n.) and one (*Nosybelba* gen. n.) representing a new family (*Nosybelbidae* fam. n.).

Key-words: Acari - Oribatida - Taxonomy - new species, new genera, new family - Madagascar.

INTRODUCTION

The author describes several new oribatid taxa from Madagascar, based on material collected by the Geneva Expedition to Madagascar in 1989 by Dr. Bernd Hauser & Dr. Charles Lienhard. The present study is part of a joint research project¹ with the Arthropod Department of the Geneva Natural History Museum on soil mites of this region, a project which was outlined in the first part (MAHUNKA 1993).

Representatives of 17 species have been studied; 15 of them were found to be new to science. For six new species new genera had also to be established and one of them is considered as type genus of a new family within the superfamily Oppioidea Grandjean, 1951.

In the descriptions I generally apply the terminology used in several publications by NORTON (e.g. 1982), BEHAN-PELLETIER (e.g. 1984) and NORTON & BEHAN-PELLETIER (1986) based on Grandjean's work. The pilosity of the different parts of the body and of the legs is expressed in formulae. The sequence of the anogenital formula is: number of genital, aggenital, anal and adanal setae. Within the setal formula of the palp and the legs, the solenidia of a given segment are marked with the symbol +.

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Measurements given correspond to extremes observed in the present material; length is measured from the rostral apex to the furthestmost opposite point of the body, width refers to maximum body width (in the case of movable pteromorphae to maximum width excluding pteromorphae). The family arrangement generally follows MARSHALL & al. (1987).

LIST OF LOCALITIES

- Mad-89/2: MADAGASCAR: (prov. Tamatave: Sous-préf. Moramanga): Réserve spéciale "Analamazoatra" [anciennement Perinet] près d'Andasibe, forêt primaire, prélèvement de sol dans les angles formés par les contreforts de *Oetece* sp. (*Lauraceae*), 960 m, extraction par appareil Berlese, 21.XI.1989, leg. B. Hauser.
- Mad-89/3: MADAGASCAR: (Prov. Tamatave: Sous-préf. Moramanga): Réserve spéciale "Analamazoatra" (anciennement Perinet) près d'Andasibe, forêt primaire, prélèvement de sol au pied de *Ravensara* sp. (*Lauraceae*), 1020 m, extraction par appareil Berlese, 21.XI.1989, leg. B. Hauser.
- Mad-89/29: MADAGASCAR: (Prov. Antsiranana [anciennement Diego-Suarez]): Sous-préf. Andoany [anciennement Hell-Ville]: Ile de Nosy Be, Réserve naturelle intégrale "Lokobe", forêt primaire près d'Ampasindava, prélèvement de sol dans les angles formés par les contreforts d'un grand arbre, extraction par appareil Berlese, 28.XI.1989, leg. B. Hauser.
- Mad-89/43: MADAGASCAR: (Prov. Toliara [anciennement Tulear]: Sous-préf. Tôlanaro [anciennement Fort-Dauphin]): à 45 km de Tôlanaro sur la route vers Amboasary, forêt de *Didiereaceae*, prélèvement de sol, 65 m, extraction par appareil Berlese, 4.XII.1989, leg. B. Hauser.
- Mad-89/49: MADAGASCAR: (prov. Toliara [anciennement Tulear]: Sous-préf. Tôlanaro [anciennement Fort-Dauphin]): à 53 km de Tôlanaro sur la route vers Amboasary, forêt de *Didiereaceae*, prélèvement de sol, 75 m, extraction par appareil Berlese, 5.XII.1989, leg. B. Hauser.
- Mad-89/52: MADAGASCAR: (Prov. Tamatave: Sous-préf. Ambodifotatra): Ile de Nosy Boraha [anciennement Ile Sainte-Marie], région de "La Crique", forêt de "Kalalao" au sud-est de Lonkinty, forêt primaire, prélèvement de sol dans les angles formés par les contreforts d'un grand arbre, 80 m, extraction par appareil Berlese, 7.XII.1989, leg. B. Hauser.
- Mad-89/54: MADAGASCAR: (Prov. Tamatave: Sous-préf. Ambodifotatra): Ile de Nosy Boraha [anciennement Ile Sainte-Marie], région de "La Crique", forêt de "Kalalao" au sud-est de Lonkinty, forêt primaire, prélèvement de sol dans les angles formés par les contreforts d'un grand arbre, 105 m, extraction par appareil Berlese, 7.XII.1989, leg. B. Hauser.

LIST OF SPECIES

APHELACARIDAE Grandjean, 1954

Aphelacarus acarinus (Berlese, 1910)

Locality: Mad-89/49.

Distribution: holarctic [MARSHALL & al. (1987)]; **new for Madagascar.**

PROTOPLOPHORIDAE Ewing, 1917

Bursoplophora madagassica sp. n.

Localities: Mad-89/43; Mad-89/49.

EREMULIDAE Grandjean, 1965

Caveremulus cordisetus Mahunka, 1983

Locality: Mad-89/29.

Distribution: Madagascar (MAHUNKA 1983, 1993).

OTOCEPHEIDAE Balogh, 1961

Didierotocepheus berndi gen. n., sp. n.

Localities: Mad-89/29; Mad-89/43.

Papillocepheus decoratus sp. n.

Locality: Mad-89/54.

Papillocepheus reductus sp. n.

Locality: Mad-89/2.

OPPIIDAE Grandjean, 1951

Brachiooppiella boraha sp. n.

Locality: Mad-89/54.

Lanceoppia cucheana sp. n.

Localities: Mad-89/2; Mad-89/3.

Lemuropia helleri gen. n., sp. n.

Locality: Mad-89/2.

Pustuloppia madagassica gen. n., sp. n.

Locality: Mad-89/2.

Radamoppia ravenala gen. n., sp. n.

Locality: Mad-89/2.

Radamoppia vanga gen. n., sp. n.

Locality: Mad-89/54.

Ramusella aepyornis sp. n.

Locality: Mad-89/49.

Striatoppia luisae sp. n.

Localities: Mad-89/3; Mad-89/52.

Fossoppia calcarata gen. n., sp. n.

Locality: Mad-89/29.

Fossoppia pirata gen. n., sp. n.

Locality: Mad-89/54.

NOSYBELBIDAE fam. n.

Nosybelba oppiana gen. n., sp. n.

Locality: Mad-89/2.

DESCRIPTIONS OF THE NEW TAXA

Bursoplophora madagassica sp. n.

Measurements. - Length of aspis: 145-174 μm , length of notogaster: 242-247 μm , width of notogaster: 249-271 μm .

Integument: Cerotegument not observable. Cuticle: pygidial part with comparatively large but flat areolae, stripes not observable. Some very fine and irregular spots present on aspis and notogaster (see BERNINI 1983: 49).

Aspis: Anterior rostral margin rounded, not incised. Five pairs of prodorsal setae and a spindle-shaped sensillus present. Very great difference observable between the two pairs of exobothridial setae, *exa* very small, but *exp* extremely long and pilose (Fig. 2). Sensillus with some fine cilia on its distal part.

Notogaster: Fourteen pairs of notogastral setae present, displaying great differences among themselves. Setae of series *c*, *h* and *ps* very short, *e* and *f* much longer than the preceding ones, setae e_1 and f_1 slightly dilate, spindle-shaped, the other two pairs simple (Fig. 7). The distance between the two setae e_1 and between setae e_1 and e_2 very small, these setae stand conspicuously near each other. Among the setae on the segment *F* the same arrangement observable. Transversal ridges, along the insertion of setae *f*, long, reaching to lateral margin (Fig. 1).

Coxisternal region: Epimeral setal formula: 3-2-2-3 (Fig. 3), most of these setae rigid and comparatively thick. Seta *4a* appearing on the median margin of epimere 4.

Anogenital region: The posterior tectum of genital plates very large, covering the anterior part of the ano-genital plates (Fig. 6). Eight (exceptionally 9) pairs of genital setae present. Anoadanal plates oblong, posterior part conspicuously protruding in lateral aspect, this part with 6 (exceptionally 5) pairs of short and simple anal setae. Hollow on the anoadanal plates indistinct, just observable.

Legs: Legs tridactylous, a strong heterodactyly is present; central claw much larger than lateral ones. Leg setal formulae:

I: 0-2-3-4+1-3

III: 2-2-2-2+1-12-3

IV: 2-2-3-1+1-11-3 (Figs 4-5)

Solenidium of tibia III long, tubuliform. Some crests visible on femora III and IV ventrally.

Material examined: Holotype: Mad-89/49, 4 paratypes from the same sample; 5 paratypes: Mad-89/43. Holotype and 5 paratypes: MHNG³ and 4 paratypes (1401-PO-1991): HNHN⁴.

Remarks: A survey of the genus *Bursoplophora* Subias & Pérez-Iñigo, 1978 was given recently by BERNINI (1983). He described two new species and mentioned some differential characters of the known species. The new species is characterized by: 1. the position of setae *e* and *f*, 2. the number of the epimeral setae, 3. the strong pygidial sculpture and 4. the setation of leg IV.

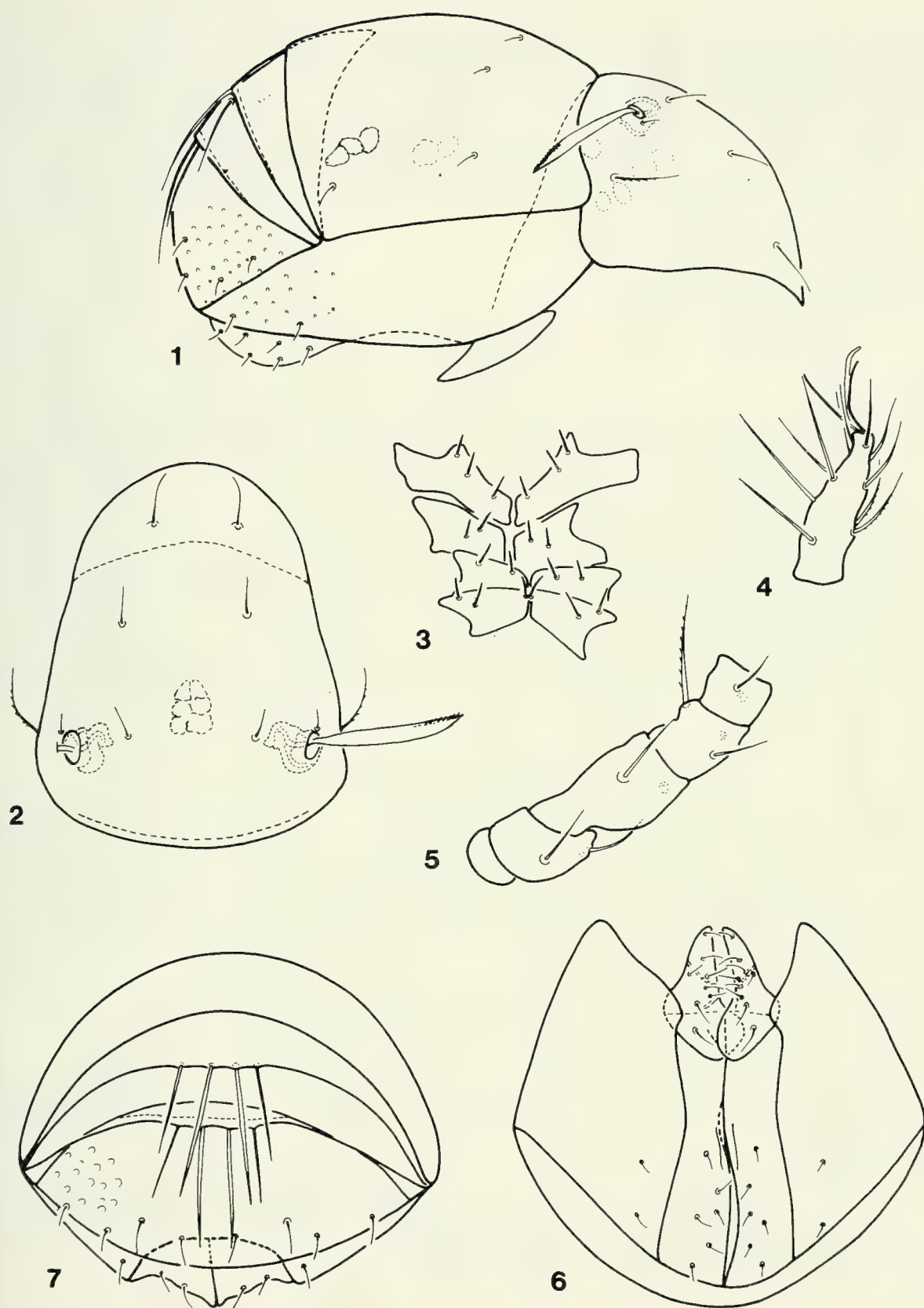
Didierotocepheus gen. n.

Diagnosis: Family *Otocepheidae*. Rostrum conspicuously flat and wide. Wide lamellae and tibia well developed; lamellar setae arising on lamellar, rostral setae on the tibial cusps. Median prodorsal condyles and both pairs of notogastral condyles absent. Eleven pairs of phylliform notogastral setae. Anogenital setal formula: 3-1-2-3. Lyrifissures *iad* in apoanal, setae ad_1 in postanal position.

Type species: *Didierotocepheus berndi* sp. n.

³ MHNG = deposited in the Muséum d'Histoire naturelle, Genève.

⁴ HNHN = deposited in the Hungarian Natural History Museum, Budapest, with identification number of the specimens in the Collection of Arachnida.



FIGS 1-7

Bursoplophora madagassica sp. n. - 1: body in lateral aspect, 2: aspis, 3: coxisternal region, 4: tarsus of leg IV, 5: basal joints of leg IV, 6: anogenital region, 7: pygidial region.

R e m a r k s : In the family *Otocephidae* Balogh, 1961 the genus *Pseudo-tocepheus* Balogh, 1960, was described from Madagascar; it was the first to have 3 pairs of genital setae. Since then some other genera have been established, characterized by 3 pairs of genital setae, but none of them has eleven pairs of phylliform notogastral setae and none lacks prodorsal and notogastral condyles.

The first part of the name is an allusion to *Didiereaceae*, an endemic family of spiny trees in Southern Madagascar.

Didierotocepheus berndi sp. n.

M e a s u r e m e n t s . - Length of body: 551-674 μm , width of body: 275-350 μm .

I n t e g u m e n t : Body covered by a very thick cerotegument layer, its sculpture mostly resembling the sculpture of the cuticle ornamented by large alveoli.

P r o d o r s u m : Lamella comparatively short, wide, lacking sharp cusps. Tutorium well developed, slightly arched laterally (Fig. 8). Median prodorsal condyles absent, lateral pair (*co. pl.*) well developed. Surface generally reticulate (alveolate), in the interbothridial region a series of pairs of larger alveoli. Rostral setae slightly thinner and shorter than the lamellar ones and arising on the distal end of tutorium (Fig. 12): the latter setae originating on the lamellar surface. Interlamellar setae the longest of all, reaching to the rostral apex. All prodorsal setae - excepting the minute exobothridial ones - finely spiculate or barbed. Sensillus very short, clavate, its surface smooth or only finely roughened.

N o t o g a s t e r : No condylus on the anterior margin of notogaster, but the shoulder slightly protruding anteriorly. Eleven pairs of long, slightly dilated, willow-leaf-shaped notogastral setae, resembling the prodorsal ones. Their whole surface spiculate. Lyrifissures *ih* stand near to *im*, before setae *h*₃ (sometimes behind it) (Fig. 9).

L a t e r a l p a r t o f p o d o s o m a : Pedotecta 1 large, pedotecta 2-3 and the discidium well developed. Setae *lc* arising on the pedotecta 1 (Fig. 12), directed forwards and smaller than *3c* or *4c*.

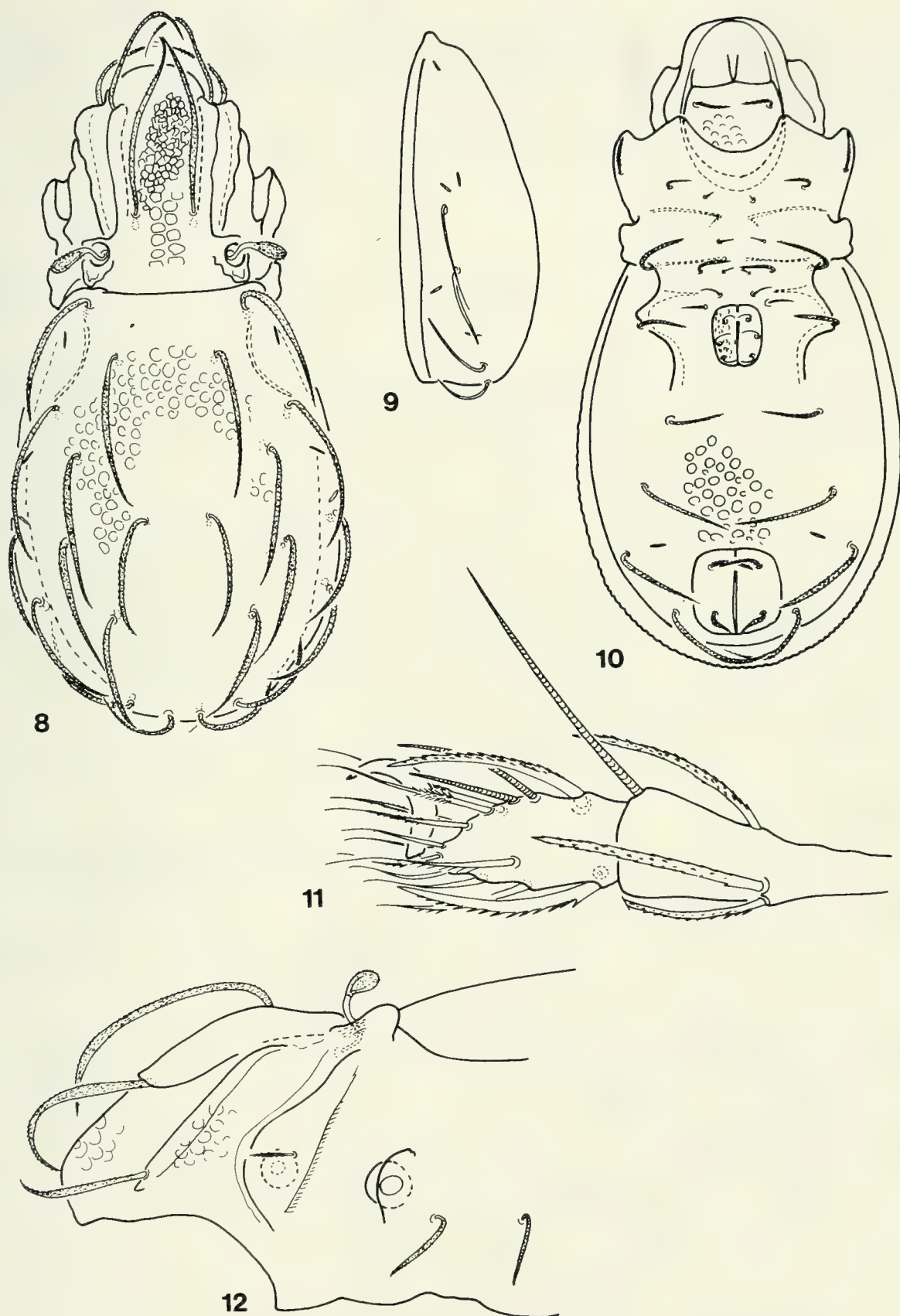
C o x i s t e r n a l r e g i o n : Epimeral borders only partly observable. Some of the setae narrow-phylliform (Fig. 10).

A n o g e n i t a l r e g i o n : Surface of genital plates ornamented by small foveolae, ventral and anal plates by alveoli. Anogenital setal formula: 3-1-2-3. All setae finely barbed.

G n a t h o s o m a : Mentum conspicuously alveolate. Other structures with the normal otocephoid characters. Palp 5-segmented, palpal setal formula 0-2-1-3-8+1. Eupathidia *u*₁ and *su*₁ very short, solenidium in normal position.

L e g s : The leg setal formulae shows a weak reduction (genu and tibia of legs III-IV):

- I: 1- 4-3+2-16+2-1
- II: 1- 4-3+1-3+1-15+2-1
- III: 2-3-0(?) +1-2+1-14-1
- IV: 1-2-1-2+1-12-1



FIGS 8-12

Didierotocepheus berndi gen. n., sp. n. - 8: dorsal side, 9: notogaster in lateral aspect, 10: ventral side, 11: leg II, 12: podosoma in lateral aspect.

Setae *ft*" of all tarsi very strong, thick, directed forwards (Fig. 11).

Material examined: Holotype: Mad-89/29; 5 paratypes from the same sample; 4 paratypes: Mad-89/43. Holotype and 6 paratypes: MHNG and 3 paratypes (1402-PO-1991): HNHM.

Remarks: See the remarks after the generic diagnosis.

***Papillocephus decoratus* sp. n.**

Measurements. - Length of body: 482-517 μm , width of body: 221-266 μm .

Integument: Thick cerotegument layer covering the whole body surface. This layer particularly thick on the rostral, sejugal and pedotectal regions, mostly consisting of filaments and of different kinds of granules. Cuticle ornamented with differing, mostly irregular alveoli.

Prodorsum: Rostrum widely rounded. Lamellae slightly convergent anteriorly. A thin translamella connecting the lamellar cusps. Interlamellar region with some weak longitudinal laths (Fig. 13). Major part of this surface reticulate, medially a series of stronger alveoli observable. Rostral and lamellar setae willow-leaf-shaped, first ones thinner than the latter; interlamellar setae also dilate, but their basal part strongly narrowed, like a peduncle. Sensillus short, clavate. Its surface and that of all these setae distinctly spiculate or barbed. Bothridium opening laterally, its posterior part connected with the large outer prodorsal concyles (*co.pl.*).

Notogaster: Ten pairs of spoon-shaped setae of different size present, their peduncle short, their head mostly round. Notogastral surface ornamented by irregular alveoli.

Lateral part of podosoma: Pedotecta 1 large, conspicuously foveolate. Setae *lc* arising at their basis behind the acetabulum (Fig. 17). Pedotecta 2-3 small, rounded.

Coxisternal region: Epimeral border wide. Epimeral setal formula: 2-0-3-2. Setae *la* usually represent only by indistinct alveoli.

Anogenital region: Genital plates dark, with 3 pairs of setae. Their alveoli conspicuously strongly framed. The position of the anal and adanal setae, and of the lyrifissures *iad* shown in Fig. 15.

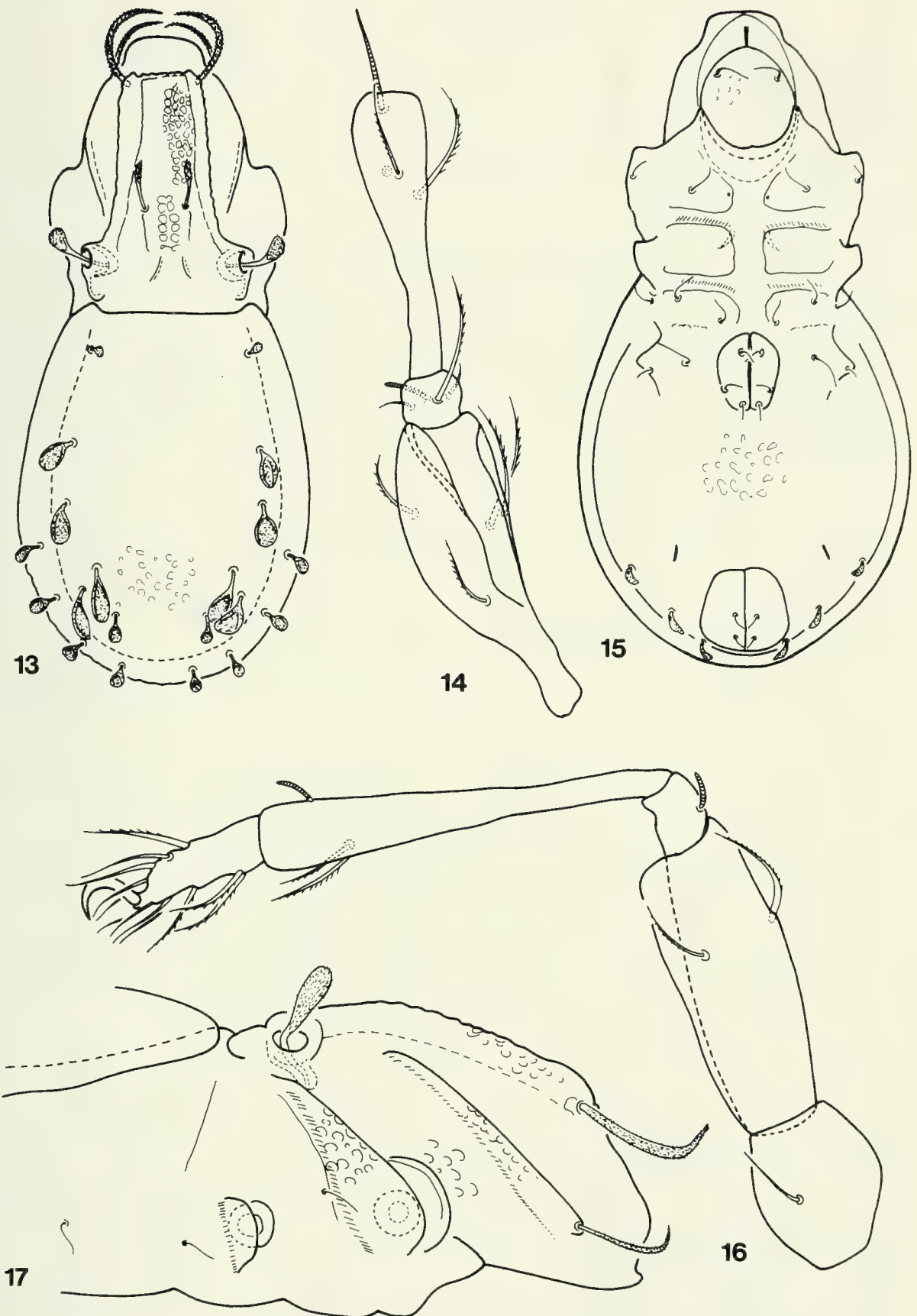
Gnathosoma: Mentum very highly arched anteriorly (nearly of "galumnoid-type").

Legs: Type of the ultimate setae L-L-L-L. Leg setal formulae:

- I: 1- 4-3+1-4+1-16+2-1
- II: 1- 4-3+1-3+1-15+2-1
- III: 2-3-1(?) +1-2+1-15-1
- IV: 1-2-1(?) -2+1-12-1 (Fig. 16)

All femora have a blade-like ventral formation and a deep fossa on the genu and tibia (Fig. 14).

Material examined: Holotype: Mad-89/54; 1 paratype from the same sample. Holotype: MHNG and the paratype (1403-PO-1991): HNHM.



FIGS 13-17

Papillocepheus decoratus sp. n. - 13: dorsal side, 14: basal joints of leg II, 15: ventral side, 16: leg IV, 17: podosoma in lateral aspect.

R e m a r k s : The differential diagnosis will be given following the next *Papillocephus* species.

Papillocephus reductus sp. n.

M e a s u r e m e n t s : Length of body: 565-620 µm, width of body: 206-261 µm.

P r o d o r s u m : Conspicuously large, with a very wide cervical region behind the prodorsal condyles. Rostral region bent down, well visible in lateral aspect (Fig. 20), therefore the whole body angulate, "brick-shaped". Rostrum widely rounded, lamellae ending far from the rostrum, without a sharp lamellar cusp. Interlamellar region smooth, only a pair of weak longitudinal crests observable on it. Tutorium strong, arched forwards. Rostral and lamellar setae narrow, willow-leaf-shaped, interlamellar ones setiform, all three pairs barbed. Sensillus very short, fusiform, its surface also barbed. Cervical region pustulate laterally.

N o t o g a s t e r : Anterolateral condyles (*co.nl.*) absent. Only eight (!) pairs of notogastral setae present. Four pairs of them spoon-shaped, four pairs in posteromarginal position fine, simple, smooth (Fig. 18).

L a t e r a l p a r t o f p o d o s o m a : Pedotecta 1 and pedotecta 2-3 large, completely covering the acetabula in lateral view (Fig. 20).

C o x i s t e r n a l r e g i o n : Very similar to that of *Papillocephus decoratus*. Lateral setae of epimeres (1*c*, 3*c*, 4*c*) shorter than their inner pairs (1*b*, 3*b*, 4*b*).

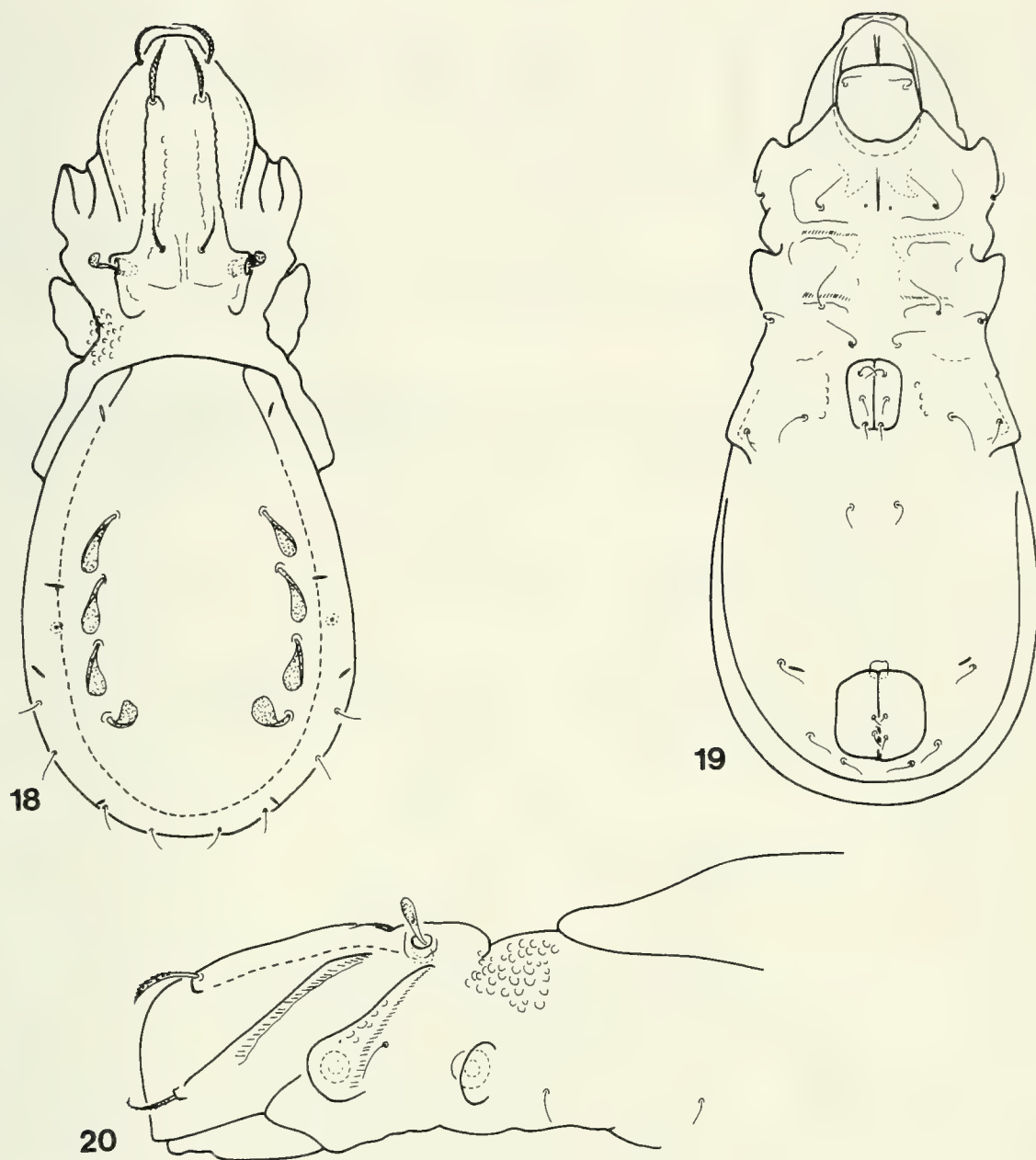
A n o g e n i t a l r e g i o n : the number and position of the lyrifissures corresponding to those of the other *Papillocephus* species. Genital plates dark, genital setae comparatively long, adanal setae simple, setiform (Fig. 19).

G n a t h o s o m a : Anterior margin of mentum only weakly arched forwards. No peculiar differential characters against the other *Papillocephus* species present.

L e g s : Form and chaetotaxy very similar to those of *Papillocephus decoratus*. Femur III with 3 setae (I was unable to find the setae on genu III and IV, only the solenidium on genu III was clearly observable).

M a t e r i a l e x a m i n e d : Holotype: Mad-89/2, 1 paratype from the same sample, 2 paratypes: Mad-89/54. Holotype and 1 paratype: MHNG and 2 paratypes (1404-PO-199): MNHM.

R e m a r k s : Hitherto in the genus *Papillocephus* Balogh & Mahunka, 1966 only two species were known, one from South Africa (the type species: *Papillocephus heterotrichus* Balogh & Mahunka, 1966) and one from Kenya (*P. areolatus* Mahunka, 1987). On the basis of the number of notogastral setae and the 4 pairs of simple setae in posteromarginal position, one (*P. reductus*) of the two new species stands far from the others. The other new species (*P. decoratus*) stands nearer to the earlier described ones, but it may easily be distinguished from *P. areolatus* by the irregular and smaller areolae on the notogaster, and from *P. heterotrichus* Balogh & Mahunka, 1966, by the ratio of the notogastral setae and the form of the setae in the posteromarginal position (they are smaller, shorter and rounder in the new species, elongated and longer in *P. heterotrichus*).



FIGS 18-20

Papillocephus reductus sp. n. - 18: dorsal side, 19: ventral side, 20: podosoma in lateral aspect.

***Brachioppiella boraha* sp. n.**

Measurements. - Length of body: 290-305 μm , width of body. 145-152 μm .

Prodorsum: Rostrum rounded. Lamellar line (or a weak costula) with arched transcostula present. In the interlamellar region two pairs of spots and a pair of strong longitudinal laths at the basis of interlamellar setae also observable. The prodorsal surface, along the longitudinal costulae and laterally, conspicuously pustulate

or granulate (Fig. 21). Setae *ro* the longest of all prodorsal setae and distinctly ciliate, setae *le* thin, setiform, setae *in* erect, pin-shaped. Sensillus slightly dilated, on this dilated part unilaterally 7 diversely long branches.

N o t o g a s t e r : Ten pairs of simple notogastral setae present, *c*₂ minute, setae *lp* originating far anteriorly, near *lm* (Fig. 21).

L a t e r a l p a r t o f p o d o s o m a : Exobothridial and sejugal region fairly granulate or pustulate. This granulation is separated from that of the lamellar region (Fig. 23). Pedotecta 1 normal, discidium flat, slightly rounded, without projecting cusps.

C o x i s t e r n a l r e g i o n : Epimeral borders well developed, apodemata 4 strongly arched posteriorly, behind the genital aperture, *bo.4* composing a transversal band (Fig. 22). On the sejugal region a pair of tubercles directed forwards. All epimeral setae simple, or slightly ciliate. Setae *lc* arising on pedotecta 1.

A n o g e n i t a l r e g i o n : Anogenital setal formula 5-1-2-3. Setae *ad*₁ in post-, *ad*₃ in preanal, lyrifissures *iad* in inverse apoanal, position. Setae *ad*₃ arising far laterally, only slightly behind the aggenital setae.

G n a t h o s o m a : The structure of this region shows the normal "oppioid" characters. The solenidium of the palpus is also in the normal position.

L e g s : All legs show the normal oppioid morphology. The femora with conspicuously porose area dorsally. Leg setal formulae:

I: 1-5-2+1- 4-20+2-1 (Fig. 24)

II: 1-5-2+1- 4+1-14+2-1

III: 2-3-1+1-3+1-13-1

IV: 1-2-2-3+1-10-1 (Fig. 25)

M a t e r i a l e x a m i n e d : Holotype: Mad-89/54; 5 paratypes from the same sample. Holotype and 3 paratypes: MHNG and 2 paratypes (1405-PO-1991): HNHM.

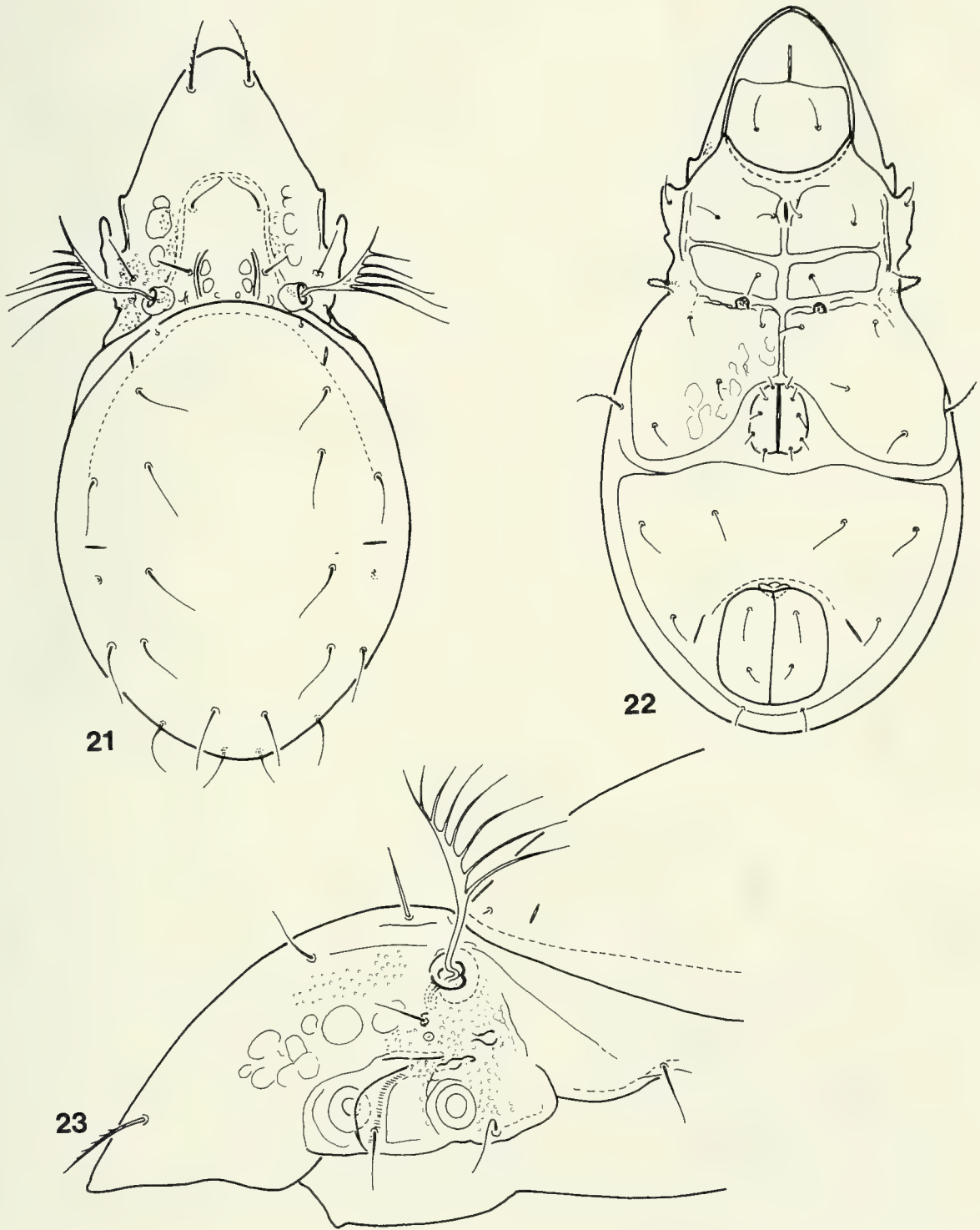
R e m a r k s : The new species is provisionally placed in the genus *Brachioppiella* Hammer, 1962; however, it is distinguishable from the hitherto known species by the form of the epimeral borders (it rather resembles the form known in the genus *Gittela* Hammer, 1961), the presence of setae *c*₂ and by the granulation of the lamellar region.

The species is named after the island of Nosy Boraha (formerly Ile Sainte-Marie).

Lanceoppia cucheana sp. n.

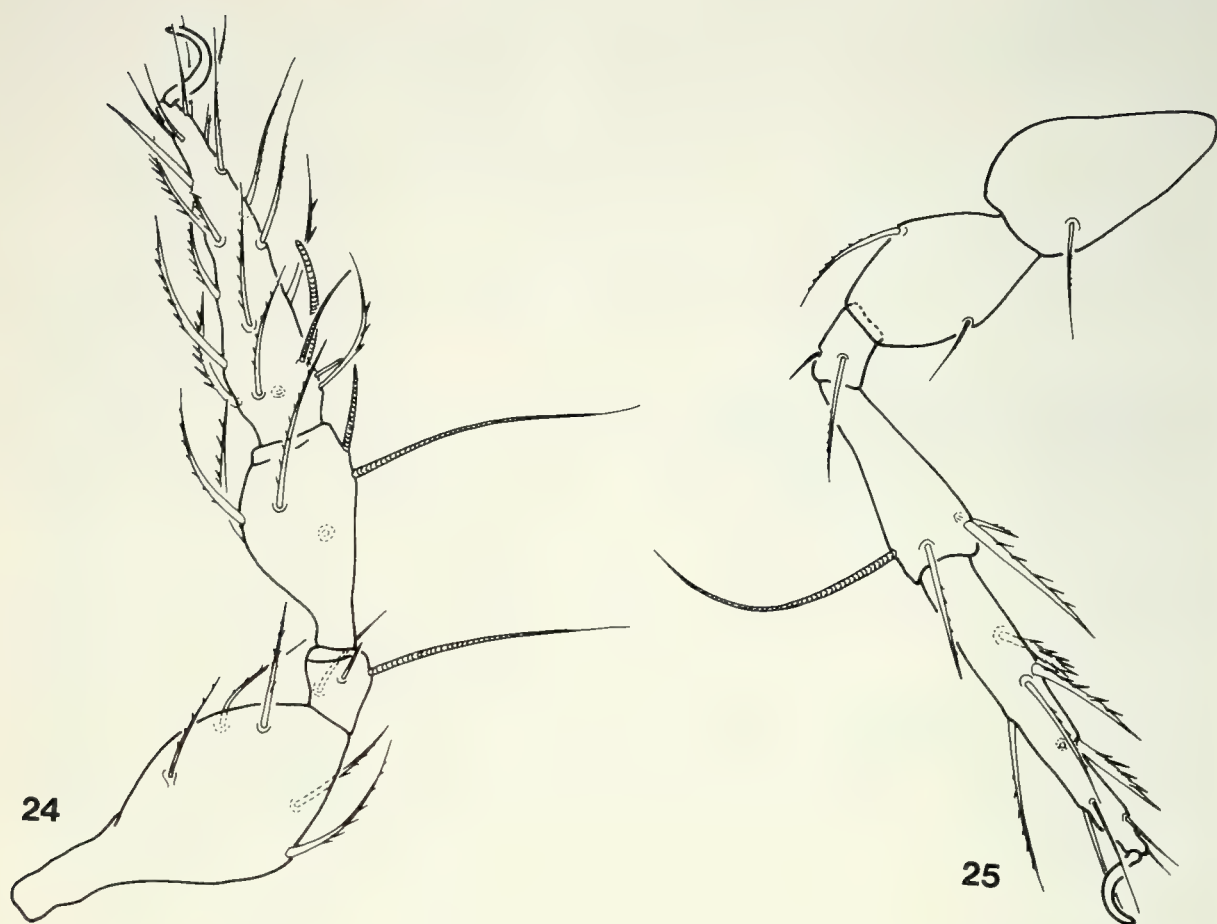
M e a s u r e m e n t s . - Length of body: 438-517 µm, width of body: 258-320 µm.

P r o d o r s u m : Rostral apex elongated, nasiform in dorsal view (Fig. 26). Longitudinal costula or lamellar lines absent, but a weak transversal ridge observable in front of the lamellar setae. A pair of triangular apophyses and some spots are present in the interbothridial region. Lateral part of prodorsum distinctly but finely granulate. Rostral setae thicker than the other prodorsal setae, interlamellar and exobothridial ones very short. Sensillus long, gradually dilated distally, with some minute spines on its



FIGS 21-23

Brachioppiella boraha sp. n. - 21: dorsal side, 22: ventral side, 23: podosoma in lateral aspect.



FIGS 24-25

Brachioppiella boraha sp. n. - 24: leg I, 25: leg IV.

distal end. A pair of conspicuous, round structures, like porose areas, observable in the dorsosejugal region.

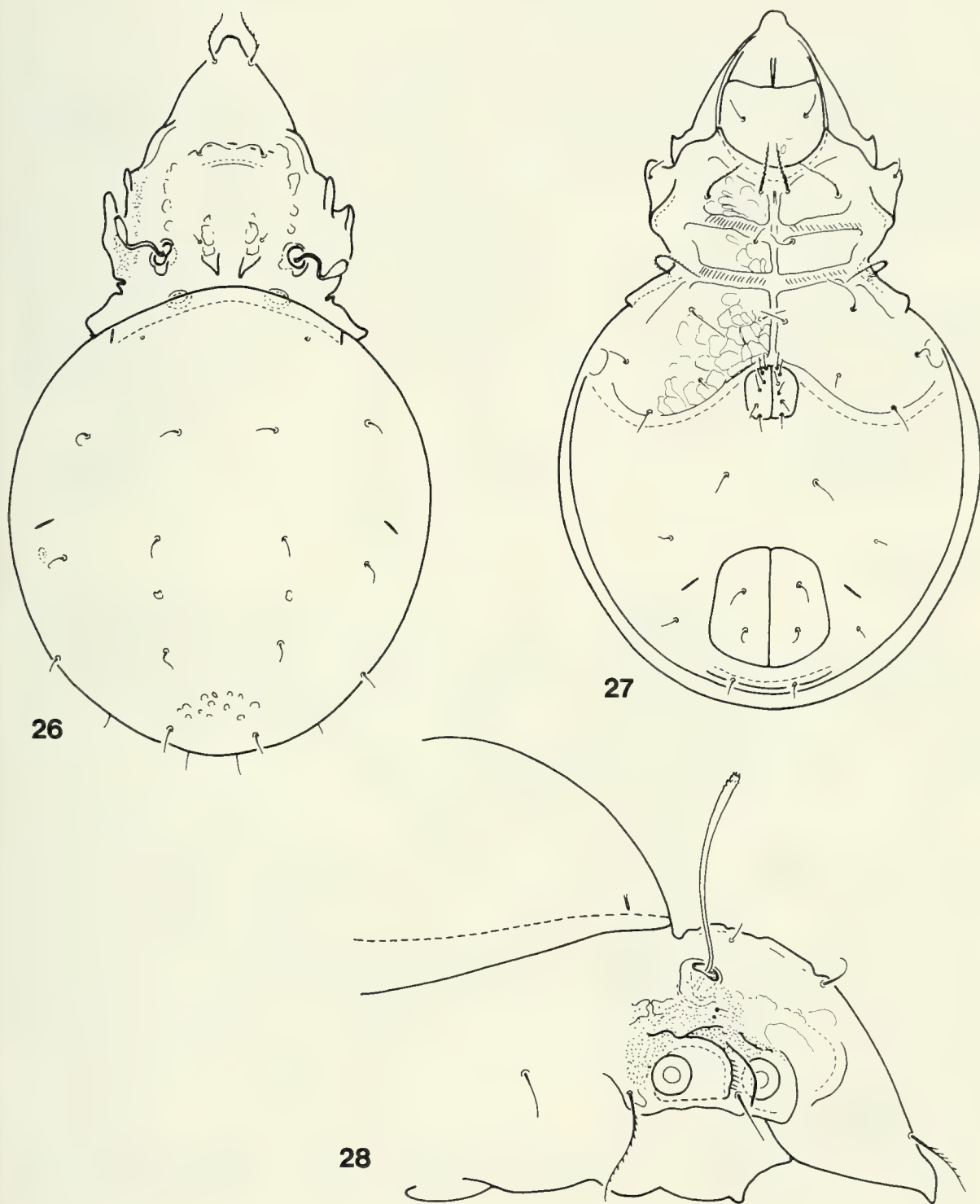
Notogaster: Nine pairs of very short and simple setae and the alveoli of setae c_2 present. The latter sometimes completely reduced.

Lateral part of podosoma: The fine granulation spreading also over the sejugal region, but lacking around leg III (Fig. 28). Pedotecta 1 small, squamiform, pedotecta 2-3 and the discidium reduced, not observable.

Coxisternal region: Epimeral borders well developed, all epimeres framed. The shape of the epimeral setae characteristic for this species. Setae $1a$ very long, directed forwards, setae $1b$ and $3c$ also long, but $1c$ and the setae on epimere 4 short, e.g. $4b$ and $4c$ longer than $2a$ (Fig. 27).

Anogenital region: Genital aperture small and originating anteriorly between the epimeral borders 4. Anogenital setal formula: 6-1-2-3. Setae ad_1 in postanal position, arising in a short arched lath.

Gnathosoma: No particularly interesting structures in this region. Palpal setal formula: 2-1-3-9+1. Palpal solenidium in normal position.



FIGS 26-28

Lanceoppia cucheana sp. n. - 26: dorsal side, 27: ventral side, 28: podosoma in lateral aspect.

Legs: Narrow and slender, legs III-IV conspicuously long. Leg setal formulae:

I: 1-5-2+1-4+2-20+2-1 (Figs 29-30)

II: 1-5-2+1-4+1-14+2-1

III: 2-3-1+1-3+1-13-1 (Fig. 31)

IV: 1-1-2-3+1-10-1 (Fig. 32)

Trochanter III with a strong spur. Some setae on tibia and tarsus of legs II-IV erect, spiniform, pike-shaped (Fig. 31) and some (*v*) on tarsi II and IV plumose.

Material examined: Holotype: Mad-89/2; 5 paratypes from the same sample; 2 paratypes: Mad-89/3. Holotype and 4 paratypes: MHNG and 3 paratypes (1406-PO-1991): HNHM.

Remarks: On the basis of the prodorsal sculpture and the characteristic spiniform setae on leg III, the new species resembles "*Oppia*" *spinipes* Balogh, 1962, described from Madagascar. But the new species can be distinguished from it by the shape of the sensillus (simple, fusiform in *O. spinipes*) and the position of the lyrifissures (adanal in *O. spinipes*).

I dedicate the new species to Mrs T. Cuhe, the assistant of Dr. B. Hauser at the Geneva Museum, for her help in our scientific work.

Lemuropia gen. n.

Diagnosis: Family *Oppiidae*. Notogaster strongly convex (Fig. 36). Prodorsal apex without incision. A short costula present, notogastral crista absent. Sensillus very long, slightly fusiform. Thirteen pairs of notogastral setae with strong heterotrichy present. Setae *c*₂ reduced. Setae *1c* arising far from pedotecta 1. Gnathosoma and legs typical, with the "oppiid" characters.

Type species: *Lemuropia helleri* sp. n.

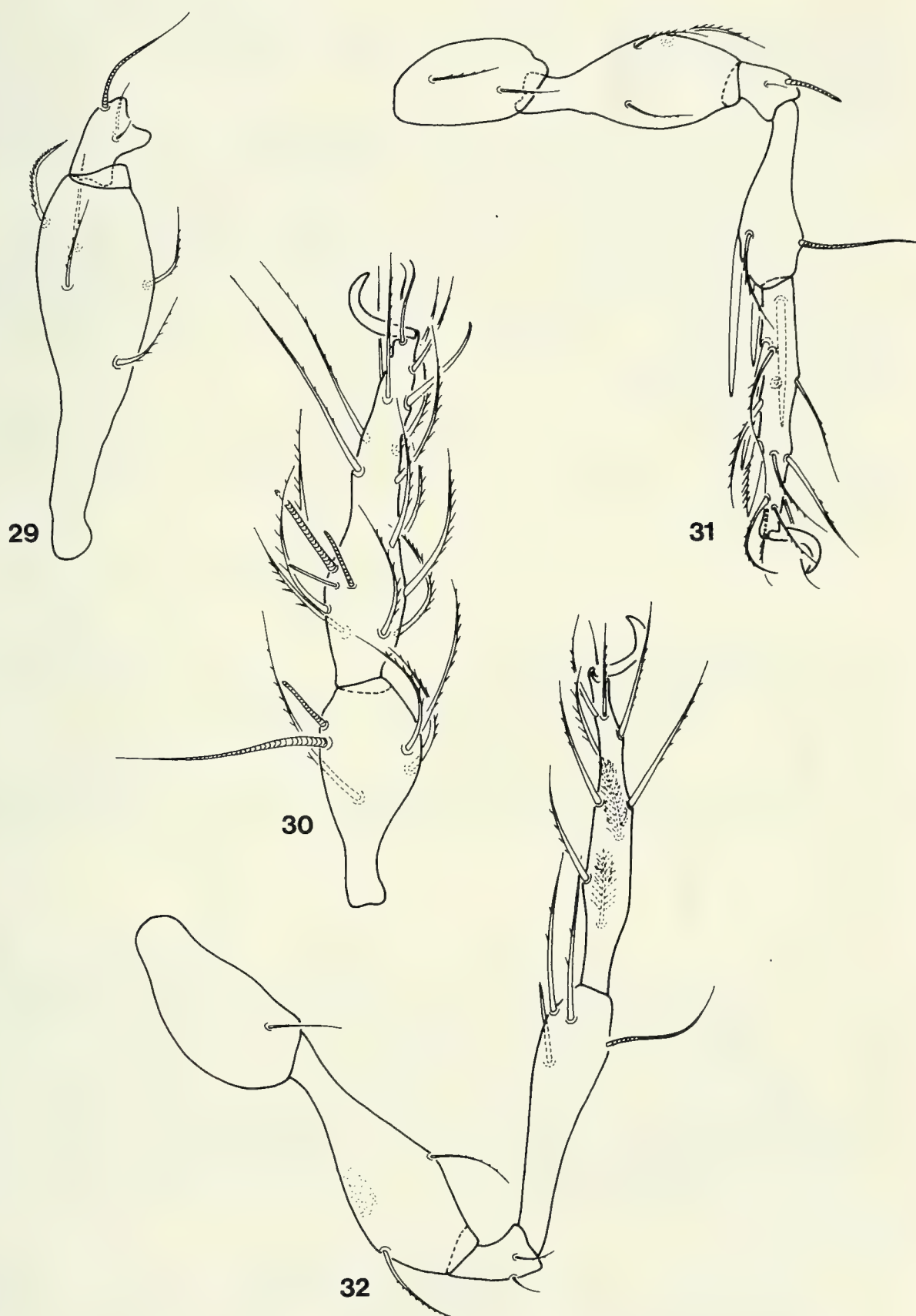
Remarks: On the basis of the elongate legs, the long sensillus and the notogastral heterotrichy the new species should be assigned to the genus *Lasiobelba* Aoki, 1959. However, all heretofore known species of this genus have ten pairs of notogastral setae and their prodorsum never display any lamellar lines or costulae. Accordingly, the erection of a new supraspecific taxon is unavoidable.

The first part of the name alludes to the lemurs, a group of primates endemic to Madagascar.

Lemuropia helleri sp. n.

Measurements. - Length of body: 251-143 µm, width of body: 286-162 µm.

Prodorsum: Rostrum rounded, without any incision or indentation. A short lamellar line, or weak costula present (Fig. 33), the thin, simple lamellar setae arising on its distal end. Rostral setae originating on the dorsal surface of prodorsum, comparatively near to each other, much thicker than the lamellar setae. Interlamellar setae completely reduced, represented only by alveoli. Exobothridial setae very long and thin, inserted inconspicuous protuberances. Bothridium with a basal tubercle,



FIGS 29-32

Lanceoppia cucheana sp. n. - 29-30: leg I, 31: leg III, 32: leg IV.

sensillus (Fig. 35) characteristic of species: nearly spindle-shaped, but blunt at tip, with some spicules on its whole surface. Some irregular alveoli visible in the interlamellar region.

N o t o g a s t e r : Thirteen pairs of notogastral setae present, c_2 reduced, represented only by their alveoli. Among the notogastral setae an extreme heterotrichy observable, two pairs of setae very long, pilose, all others short and simple (Fig. 33).

L a t e r a l p a r t o f p o d o s o m a : Exobothridial region (Fig. 37) granulated. Pedotecta 1 small, seta $1c$ arising far from it. Setae $3c$ and $4c$ very long, ciliate.

C o x i s t e r n a l r e g i o n : Epimeres 2 and epimeres 3-4 not touching medially. Among the epimeral borders $bo.2.$ and $bo.sej.$ well developed, one pair of robust tubercles visible on the latter (Fig. 34). Setae $1b$ much longer than $1c$; setae $3b$, $3c$, $4b$, $4c$ also long, like $1b$.

A n o g e n i t a l r e g i o n : Anogenital setal formula: 5-1-2-3. Genital plates slightly incised on their anteromedian margin. Setae g_1 not longer than g_5 . Adanal setae and lyrifissures iad in normal position, (setae ad_1 in postanal, ad_2 and ad_3 in paraanal position).

L e g s : All legs very long, the setal formulae are:

I: 1-5-2+1- 4+2-20+2-1 (Fig. 38)

IV: 1-2-1+1-3+1-10-1 (Fig. 39)

Two ventral setae of tarsus IV plumose.

M a t e r i a l e x a m i n e d : Holotype: Mad-89/2, 25 paratypes from the same sample. Holotype and 15 paratypes: MHNG and 10 paratypes (1407-PO-1991): HNHM.

R e m a r k s : See after the generic diagnosis.

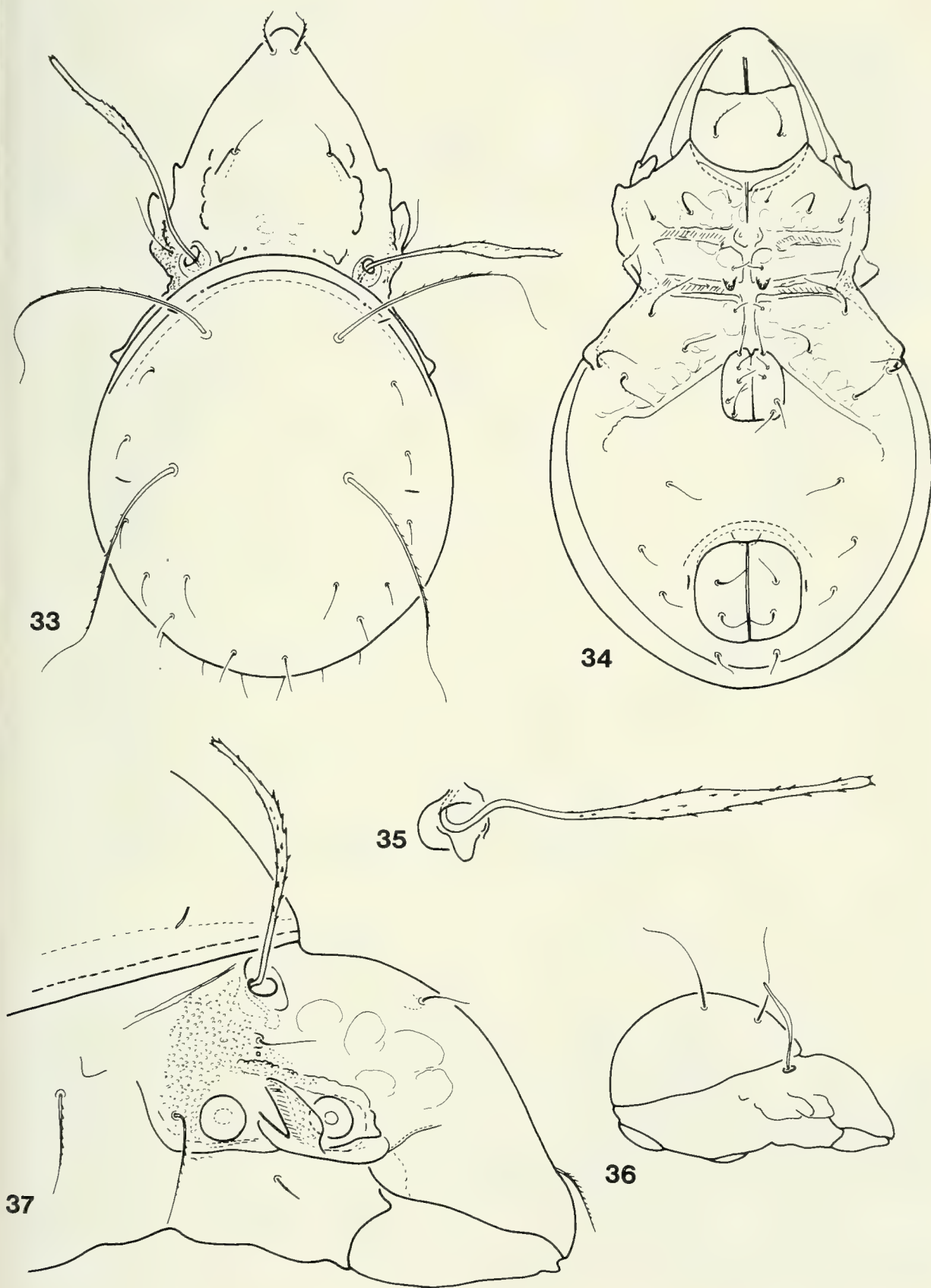
I dedicate the new species to Max Heller, chargé d'affaires of the Swiss Embassy in Antananarivo, who contributed decisively to the success of the Geneva Expedition by his invaluable help.

Pustuloppia gen. n.

D i a g n o s i s : Family *Oppiidae*. Prodorsum rounded, without any incision. Prodorsal surface without lamellar lines or costulae. Small crests in the interbothridial region and behind it a conspicuous unpaired tubercle in basal position. Sensillus very long, spindle-shaped. Strong notogastral neotrichy, 1 pair of setae long and fairly plumose, nine pairs very short. Setae c_2 minute. Podosoma strongly granulated. Setae $1c$ arising on pedotecta 1, discidium normally developed. Epimeral region heavily sclerotized. Anogenital setal formula: 5-1-2-3. Lyrifissures iad in inverse apoanal, setae ad_1 in postanal position. Legs very long, their chaetotaxy with typical "oppiid" characters.

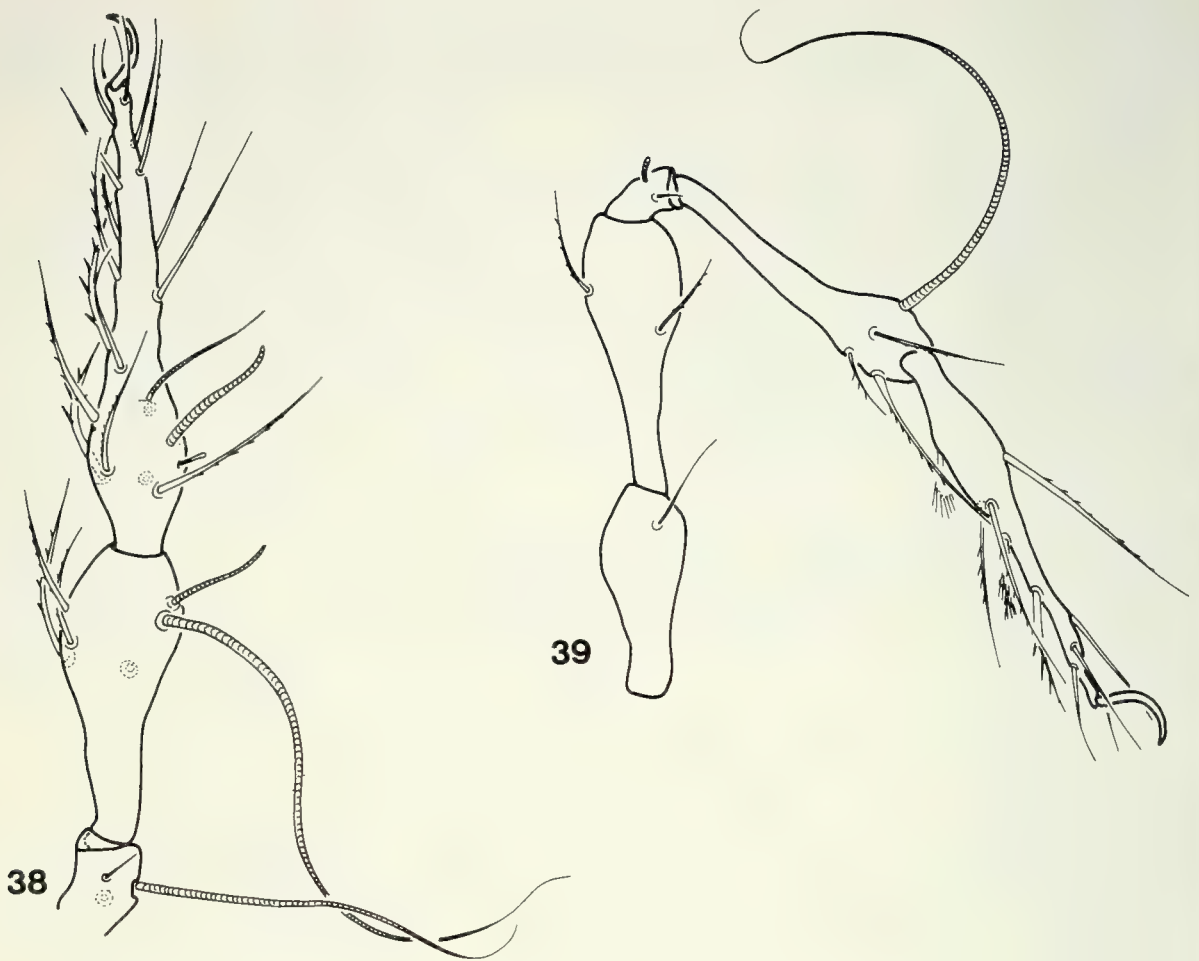
T y p e s p e c i e s : *Pustuloppia madagassica* sp. n.

R e m a r k s : On the basis of the shape of prodorsum, the strong notogastral neotrichy and the form of the sensillus the new species might be relegated to the genus *Lasiobelba* Aoki, 1959. However, on the basis of the position of the adanal lyrifissures and the interbothridial protuberances, a new genus has to be erected for this new species.



FIGS 33-37

Lemuroppia helleri gen. n., sp. n. - 33: dorsal side, 34: ventral side, 35: sensillus, 36: body, 37: podosoma in lateral aspect.



FIGS 38-39

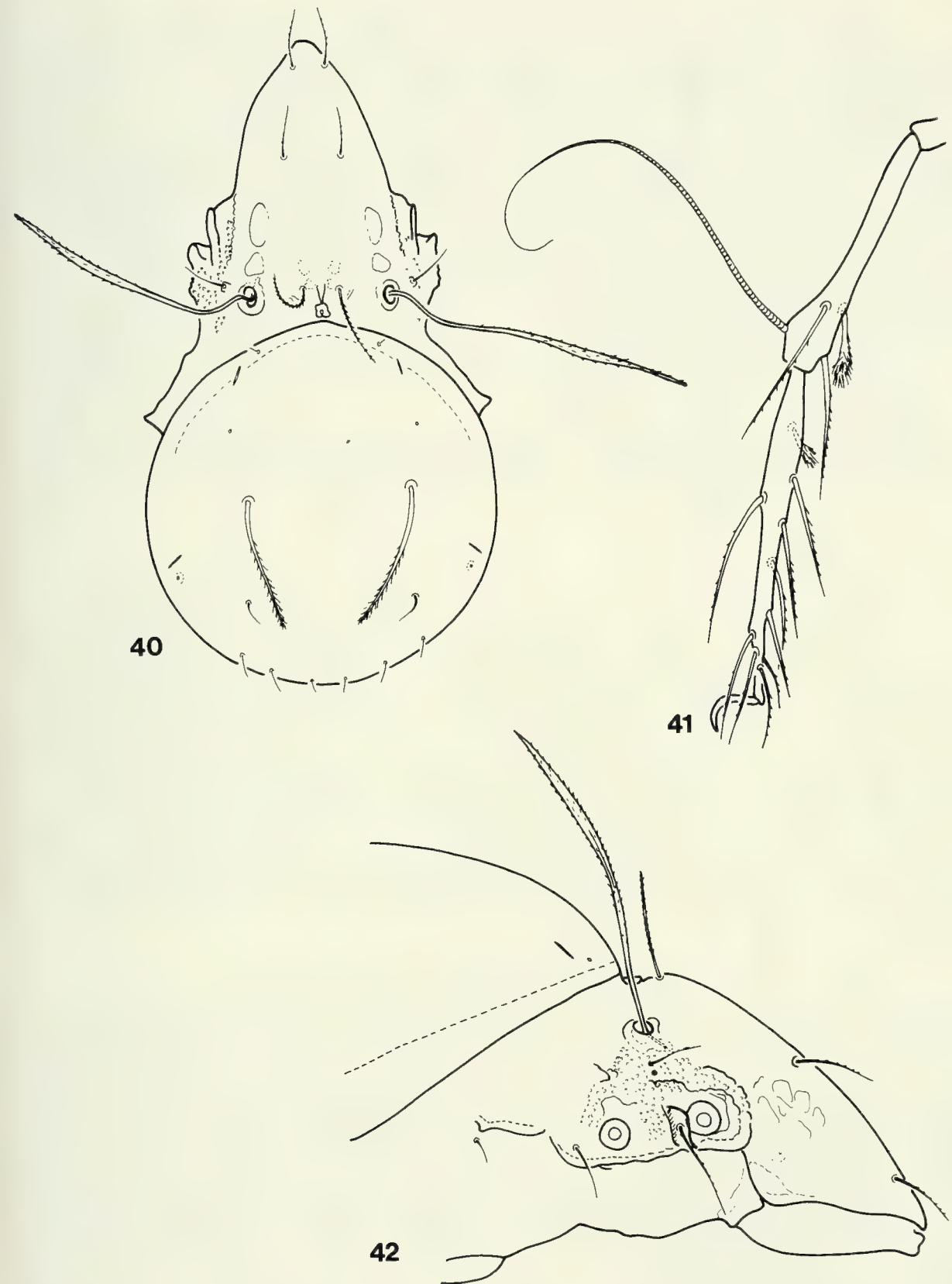
Lemuroppia helleri gen. n., sp. n. - 38: leg I, 39: leg IV.

***Pustuloppia madagassica* sp. n.**

Measurements: Length of body: 325-349 μm , width of body: 177-197 μm .

Prodorsum: Rostral part elongate, with blunt rostral apex. Prodorsal surface lacking lamellar line but with an unpaired flower-shaped tubercle basally and three small crests before it in the interbothridial region (Fig. 40). There are two pairs of irregular areolae in this region and some other ones also present before the bothridium. Lateral part of prodorsum partly granulate (Fig. 42). Rostral setae arising on the prodorsal surface, slightly thicker than the lamellar ones. Interlamellar setae more robust and more distinctly ciliate than the lamellar ones, exobothridial setae thin and simple. Sensillus very long, directed outwards, slightly incrassate medially, its whole surface conspicuously ciliate.

Notogaster: Ten pairs of notogastral setae present: one pair (*la*) long and strong, ciliate, nearly plumose at its distal end, one pair (*c*₂) minute and hardly visible, the other eight pairs short and simple (Fig. 40).



FIGS 40-42

Pustuloppia madagassica gen. n., sp. n. - 40: dorsal side, 41: tarsus and tibia of leg IV, 42: podosoma in lateral aspect.

Lateral part of podosoma: Exobothridial region granulate, exobothridial setae arising on the surface, their basal tubercles absent. Setae *1c* originating on pedotecta 1, they are much longer than setae *3c*; setae *4c* very short.

Coxisternal region: Anteromedian margin of epimeres 1 with strong tubercles, setae *1a* arising on them (Fig. 43). Epimeral borders (and apodemes) well observable, *bo.4.* distinctly arched posteriorly (Fig. 43), behind the genital aperture. Epimeres not touching medially. Epimeral surface ornamented by weak irregular spots.

Anogenital region: Anogenital setal formula: 5-1-2-3. Among the genital setae *g₅* much longer than *g₄* or *g₃*. Adanal setae conspicuously short, much shorter than the aggenital or anal ones. Lyrifissures *iad* in inverse apoanal position.

Legs: All legs very long, their chaetotaxy with the normal "oppioid" characters (Figs 41, 44-46).

Material examined: Holotype: Mad-89/2; 28 paratypes from the same sample. Holotype and 17 paratypes: MHNG and 11 paratypes (1408-PO-1991): HNHN.

Remarks: See the remarks after the generic diagnosis.

Radamoppia gen. n.

Diagnosis: Family *Oppiidae*. Rostrum without incision. Prodorsum with median, interbothridial condyles. Notogaster with 9 pairs of setae, setae *c₂* absent, but represented by their alveoli. Podosoma with a heavy sculpture, this region framed dorsally and the whole surface granulate and/or pustulate. Pedotecta 1 very small, not covering the acetabulum of leg I in lateral aspect, setae *1c* arising on it. Epimeral borders protruding, like a tectum, *bo.1* arched medially. Anogenital setal formula: 6-1-2-3, setae *ad₁* postanal, *ad₃* paraanal and lyrifissures *iad* in inverse apoanal position. Palp tarsus with a globularly dilated solenidium, originating anteriorly. Legs with "oppiid" characters (tarsus I much longer than tibia I). Setae *p* on tarsus II-IV present, spiniform.

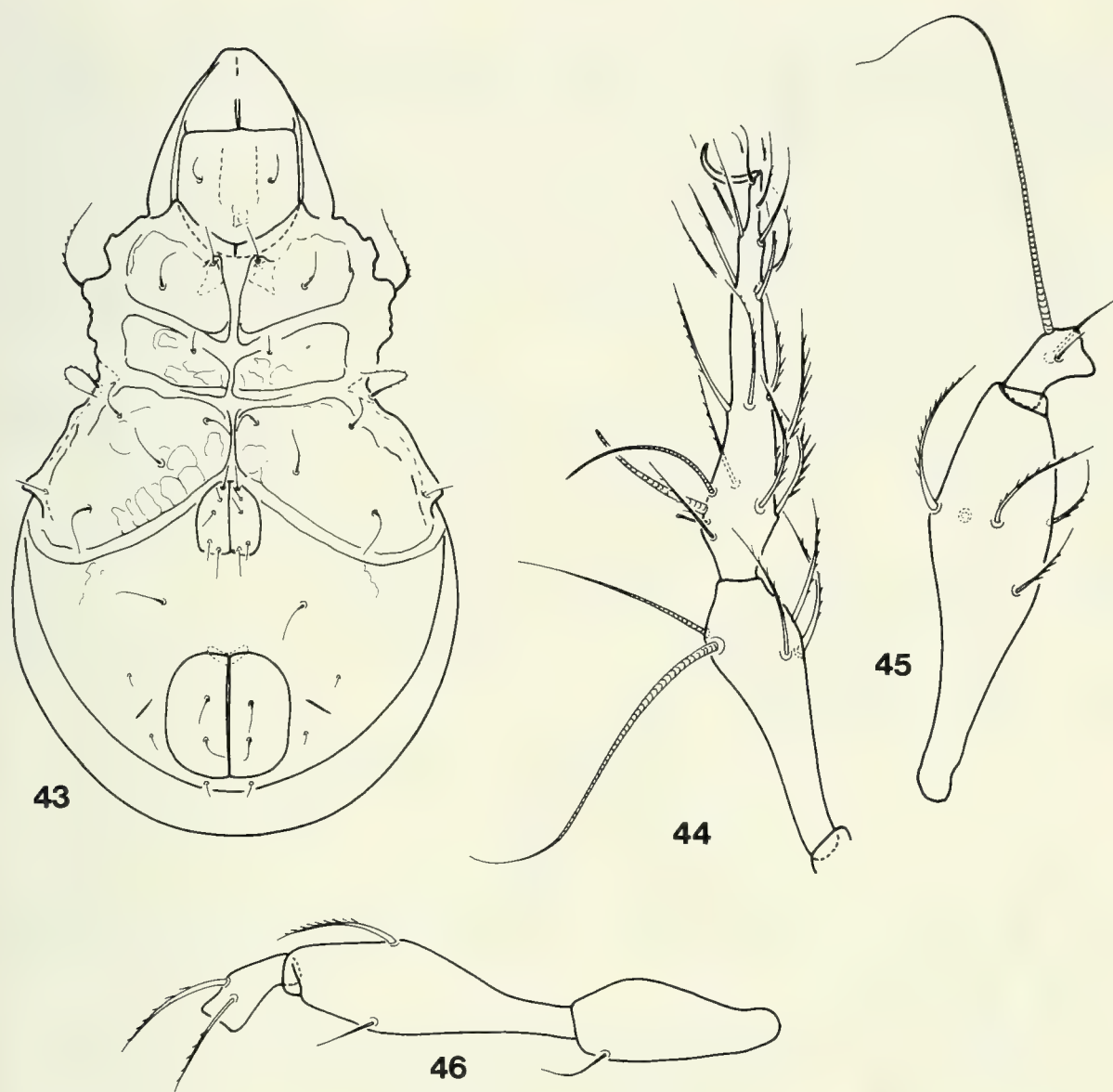
Type species: *Radamoppia ravenala* sp. n.

Remarks: The characteristic structure on the notogaster was hitherto unknown in this family. This genus comprises two species, which are described below. They can be separated by the sculpture of the notogaster, the position of the notogastral setae (*la*, *lm*) and the granulation of the podosoma (finer or rougher). The relationship of the new genus is rather problematic, but on the basis of the position of the adanal setae and the lyrifissures *iad*, it can provisionally be considered as a member of the "lanceoppioids" (sensu SUBIAS & BALOGH 1989).

The first part of the name remembers the King Radama I (1810-1828), the first monarch to unite Madagascar.

Radamoppia ravenala sp. n.

Measurements. - Length of body: 630-681 µm, width of body: 380-405 µm.



FIGS 43-46

Pustuloppia madagassica gen. n., sp. n. - 43: ventral side, 44-45: leg I, 46: basal joints of leg IV.

Prodorsum: Rostrum with strongly projecting, nasiform apex (Fig. 47), this part beak-shaped in lateral aspect (Fig. 51). Costula or lamellar lines absent, some transversal lines or band with weak irregular sculpture present in the lamellar region. One pair of prodorsal condyles and some irregular alveoli and spots present in the interbothridial region. Exobothridial region heavily granulate, this sculpture spreading over the anterolateral margin of prodorsum (Fig. 51). Setae *ro* the thickest among the prodorsal setae, but slightly shorter than *le*. Setae *in* reduced, represented only by their alveoli. Exobothridial setae short, arising on small tubercles. Sensillus long, its distal half spindle-shaped, whole surface spiculate.

Notogaster: Nine pairs of very fine and simple notogastral setae present and *c*₂ represented only by alveoli.

Lateral part of podosoma: Surface surrounding the acetabula I-III granulate or pustulate extending to the exobothridial region. This region well framed above acetabulum III. Pedotecta 1 small, squamiform, pedotecta 2-3 absent, discidium well observable as a triangular apex.

Coxisternal region: Epimeral region, especially the epimeral borders characteristic of this species (Fig. 49). Anterior margin slightly protruding and covering the surface like a tectum. *Bo.1* and *bo.2* arched inwards, *bo.4* reaching behind the genital aperture. Epimeral setae long, setae *1c* and *3c* the longest of all; setae of epimere 4 shorter than the others.

Anogenital region: Genital aperture comparatively small, originating between *bo.4*. Anogenital setal formula: 6-1-2-3, all setae thin and simple. Setae *ad*₁ in postanal position, arising on a small ridge. Lyrifissures *iad* in inverse apoanal position.

Gnathosoma: Chelicera normal (Fig. 48) with long tegula and dentate digit. Palpal setal formula: 2-1-3-9+1. Palpal solenidium originating on the distal end of tarsus, near the eupathidia, its distal end dilated, globular (Fig. 50).

Legs: All legs very long, leg IV only scarcely shorter (580 µm) than the total length of body. All joints, but principally the joints of leg III and IV conspicuously slender. The setal formulae are:

I: 1-5-2+1- 4+2-20-1 (Figs 52-53)

II: 1-5-2+1- 4+1-16-1

III: 2-3-1+1-3+1-15-1

IV: 1-2-2-3+1-12 (Figs 54-55)

On the tarsus of leg II-IV there are two setae more than in the other "oppiid" species, because the setae *p* of the tarsi are conspicuous as strong spines. Two ventral setae on tarsus IV plumose.

Material examined: Holotype: Mad-89/2, 5 paratypes from the same sample. Holotype and 3 paratypes: MHNG and 2 paratypes (1409-PO-1991): HNHM.

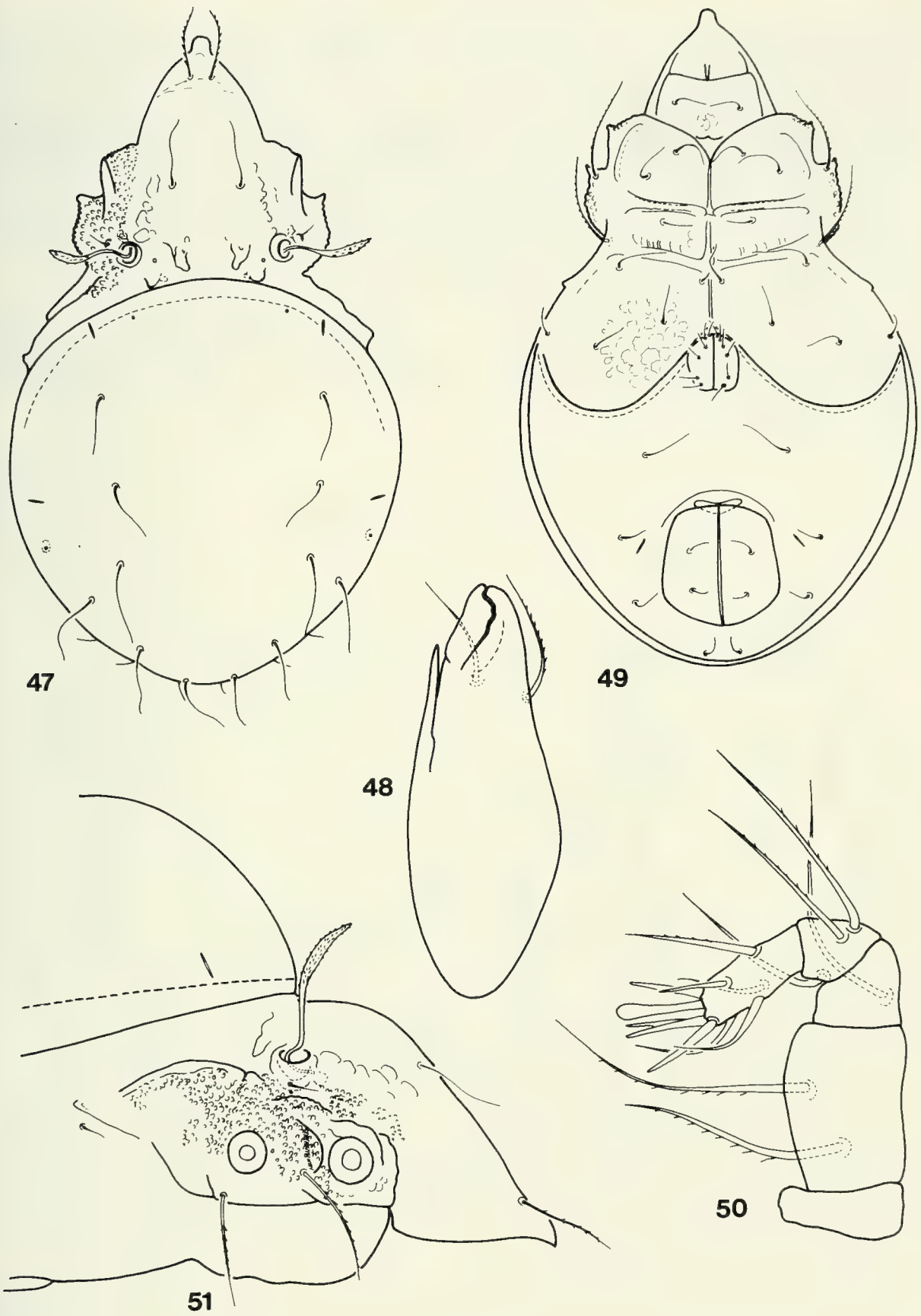
Remarks: See after the description of the next *Radamoppia* species.

The species is named after the Traveller's Palm (*Ravenala madagascariensis*), the symbol of Madagascar.

Radamoppia vanga sp. n.

Measurements. - Length of body: 623-632 µm, width of body: 380-384 µm.

Prodorsum: Rostral apex nasiform, deeply bent downwards like a beak. Lamellar lines or longitudinal costulae absent, but a transversal costula in front of the lamellar setae well visible. A heavy sculpture present in interbothridial position (Fig. 56), it consists of one pair of robust basal tubercles, some smaller ones or wrinkles before them and stronger crests around the interlamellar setae. Some irregular spots visible in this region. On the inner margin of bothridium some projections or tubercles also observable. No great difference in length among the prodorsal setae. Setae *ro* thicker and more distinctly pilose than the others. Setae *le* very thin, flagellate, setae *in*



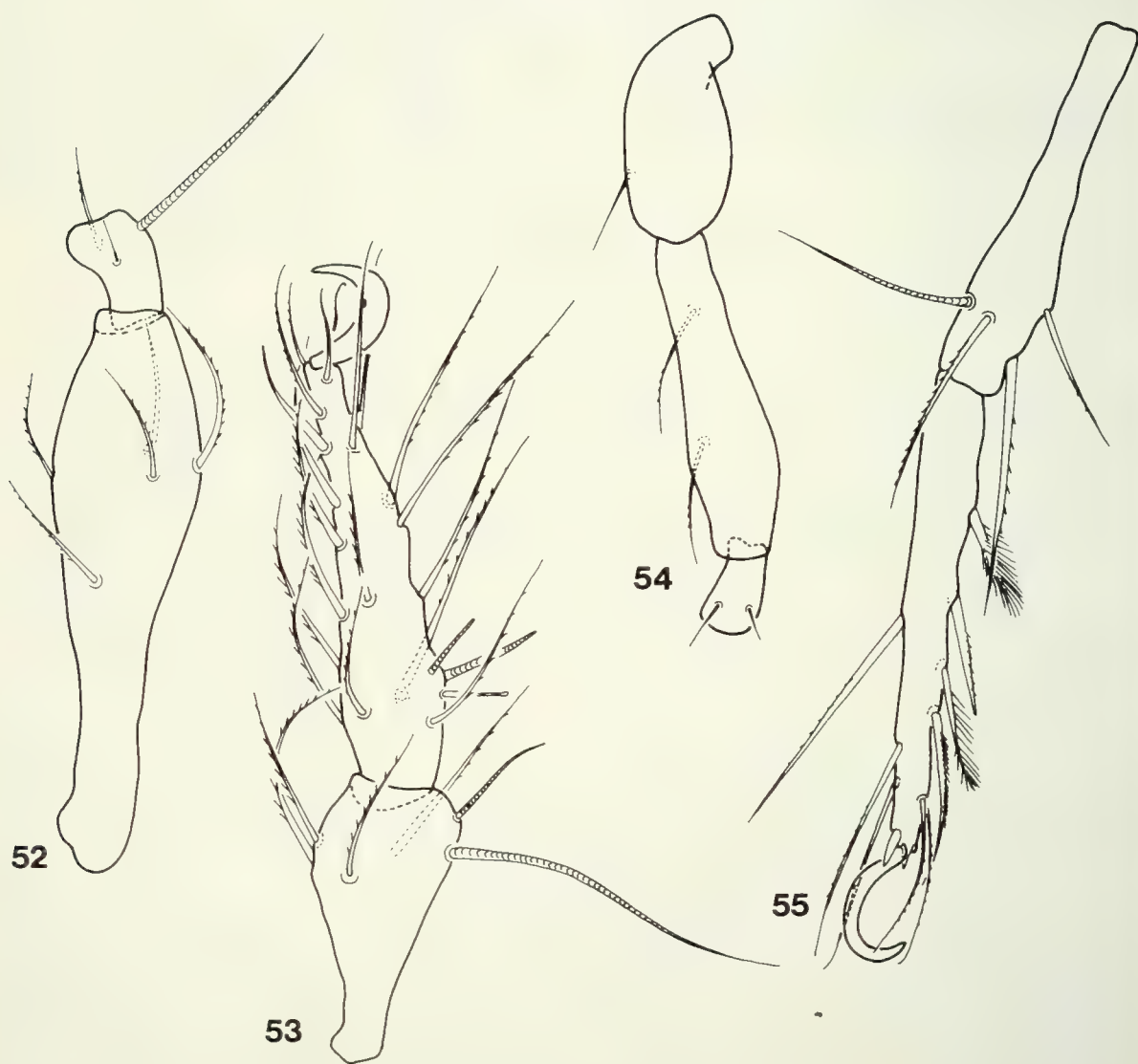
FIGS 47-51

Radamoppia ravenala gen. n., sp. n. - 47: dorsal side, 48: chelicera, 49: ventral side, 50: palp, 51: podosoma in lateral aspect.

pin-shaped. Sensillus long, hardly dilated, well spiculate. Lateral art of prodorsum fairly granulate and/or pustulate.

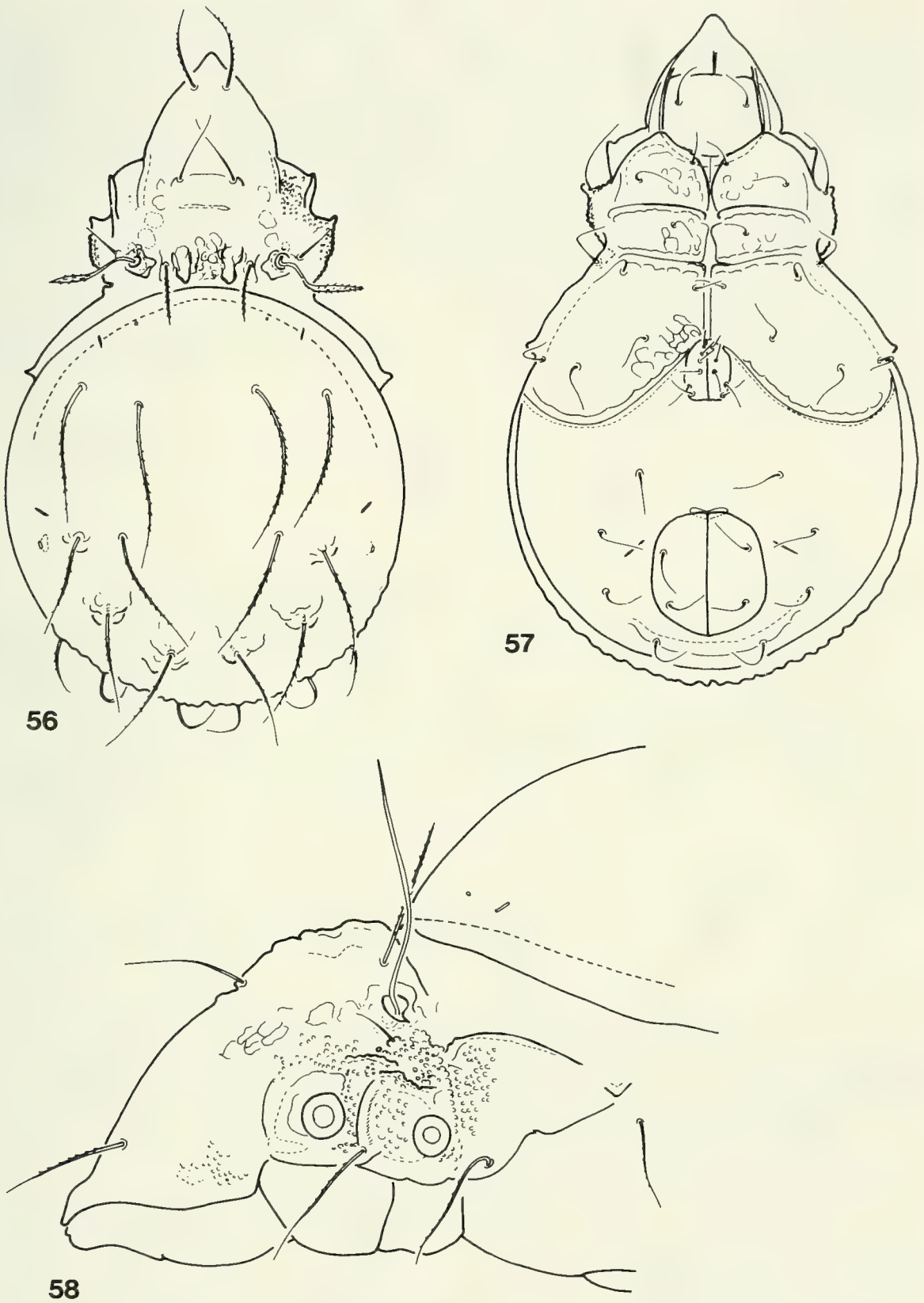
N o t o g a s t e r : Posterior part and the posterolateral margin of the notogaster with characteristic sculpture (Fig. 61), consisting of tubercles and wrinkles. On the median surface they compose a larger protuberance bearing the notogastral setae. Short, mostly longitudinal wrinkles are visible on the posterolateral margin. Nine pairs of long and finely ciliate notogastral setae present and the tenth c_2 represented only by alveoli. All setae arising on tubercles, except setae *la* and *lm*.

L a t e r a l p a r t o f p o d o s o m a : Pedotecta 1 small, squamiform, setae *lc* arising on its anterior margin, pedotecta 2-3 absent, discidium with sharp cusps. The whole surface - excepting the posterior part behind the legs III - fairly pustulate and/or granulate (Fig. 58).



FIGS 52-55

Radamoppia ravenala gen. n., sp. n. - 52-53: leg I, 54-55: leg IV.



FIGS 56-58

Radamoppia vanga gen. n., sp. n. - 56: dorsal side, 57: ventral side, 58: podosoma in lateral aspect.

Coxisternal region: All epimeral borders protruding, like a tectum (see also in *R. ravenala* sp. n.), *bo.1* and *bo.2* conspicuously arched, epimeral shields not touching medially. *Bo.5* strongly arched posteriorly, reaching behind the genital aperture. Epimeral setae long, setae *1c* the longest of all, setae *4c* shorter than *4b* or *3b*!

Anogenital region: Between the genital and anal apertures great and conspicuous differences exist (Fig. 57). A strong crest behind the anal aperture present, setae *ad*₁ arising on it. Anogenital setal formula: 6-1-2-3. Lyrifissures *iad* in inverse apoanal position.

Gnathosoma: All details of this region (e.g. the form of the palpal solenidium) similar to the preceding species.

Legs: The form and chaetotaxy of the legs are also similar to the preceding species. The leg setal formulae are:

- I: 1-5-2+1- 4+2-20+2-1
 II: 1-5-2+1- 4+1-16+2-1
 III: 2-3-1+1-3+1-15-1
 IV: 1-2-2-3+1-12-1

Famulus (ε) on tarsus I very long, nearly as long as ω_2 (Fig. 60). Setae *p* on tarsus II-IV spiniform. Two setae on tarsus IV (Fig. 59) dilated, plumose.

Material examined: Holotype: Mad-89/54; 1 paratype from the same sample. Holotype: MHNG and the paratype (1410-PO-1991): HNHNH.

Remarks: These newly described *Radamoppia* species are easily distinguishable by the form of the interlamellar sculpture.

This species is named after the Vangas, a bird family of 14 species endemic to Madagascar.

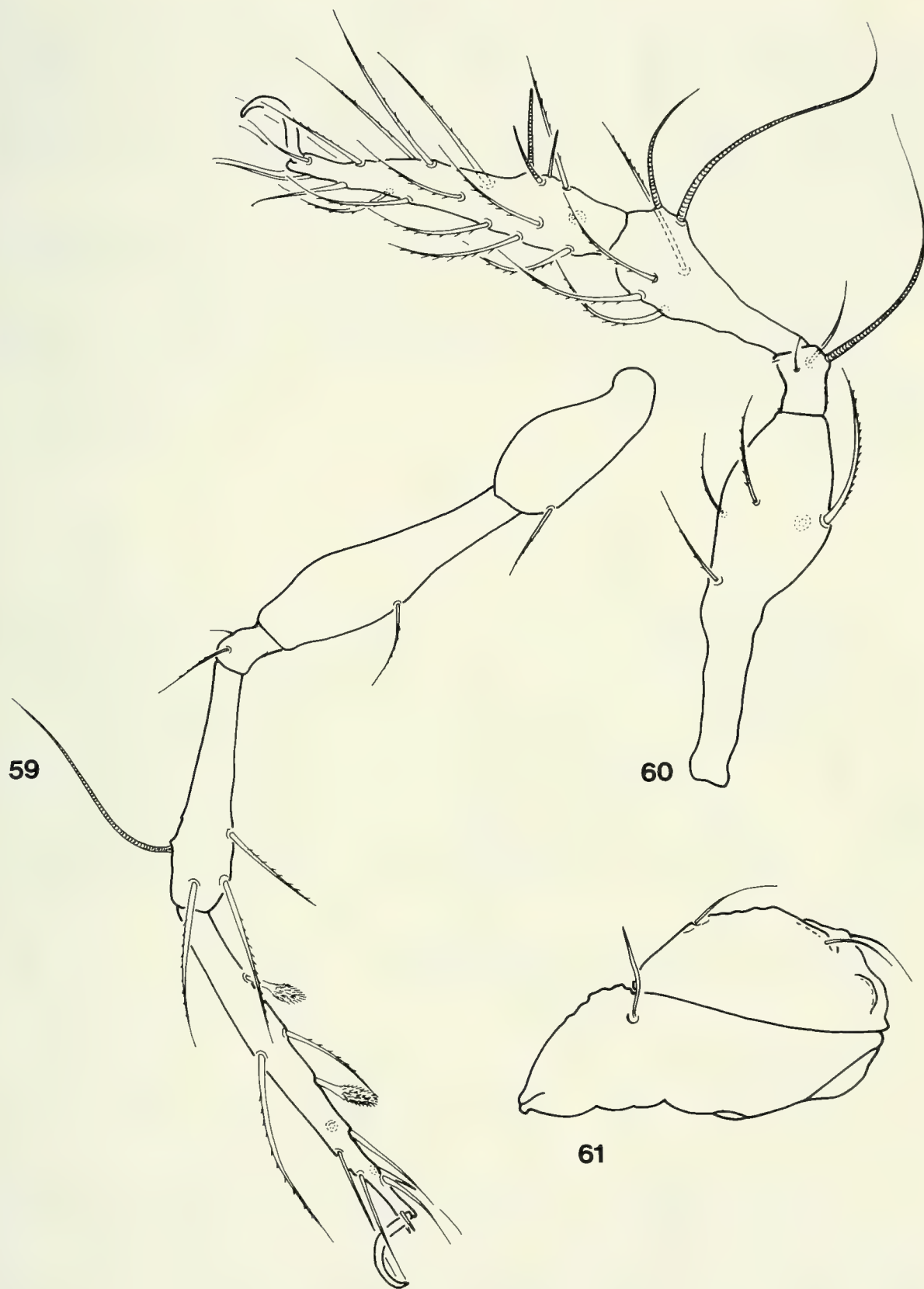
Ramusella aepyornis sp. n.

Measurements: - Length of body: 417-458 μm , width of body: 215-237 μm .

Prodorsum: Rostrum widely rounded. Short and sharp lamellar lines present on the prodorsal surface, decurrent from the bothridium and directed to the insertion of lamellar setae, but not reaching it. Some lateral pairs of spots and some in interbothridial position. Prodorsal setae varying (Fig. 64) in length and thickness, *ro* thicker and more distinctly pilose than *le*. Sensillus very long, setiform, directed outwards, with some shorter cilia laterally and 2-3 longer distally.

Notogaster: Setae *c*₂ represented only by their alveoli, the other 9 pairs of notogastral setae sparsely ciliate, fine. Setae *la* - *lm* and *lp* - *r*₃ originating nearly at the same transversal level (Fig. 62).

Lateral part of podosoma: Pedotecta 1 comparatively large, setae *1c* arising far from it. Pedotecta 2-3 triangular, well visible in ventral aspect (Fig. 63). Discidium with a long, sharp, arched apex. Exobothridial region lightly and partly granulated, but around the acetabula of legs I-II and in front of leg III a well granulated area present (Fig. 64).



FIGS 59-61

Radamoppia vanga gen. n., sp. n. - 59: leg IV, 60: leg I, 61: body in lateral aspect.

Coxisternal region: Some peculiar characters are present on this part: e. g. a characteristic, triangular field medially between the two first and partly between the second epimeres (Fig. 63); one pair of median tubercles on the sejugal borders; epimeres 4 not touching medially, the sternal apodemata well visible between them. The setae of this region are also characteristic: setae *1b* much longer than *1c*, the latter originating far from pedotecta 1, on longitudinal crests. Setae *3c* the longest of all, more ciliate than the others.

Anogenital region: Genital aperture small, originating anteriorly between the arches of epimeral borders 4. Anal aperture very large. Anogenital setal formula: 5-1-2-3. The position of setae and lyrifissures shown in Fig. 63.

Gnathosoma: The structure of this region shows the typical "oppiid" characters. Palpal setal formula: 0-2-1-3-9+1.

Legs: All legs long, narrow, with the typical "oppiid" chaetotaxy. The setal formulae are:

- I: 1-5-2+1-4+2-20-1
- II: 1-5-2+1-4+1-14-1
- III: 2-3-1+1-3+1-13-1
- IV: 1-2-2-3+1-10-1

Famulus (ϵ) stands at the basis of ω_1 . Both setae (*ft*) arising on the basal part of tarsus I (Fig. 65) behind ω_2 . All setae of femora I and II distinctly pilose. Trochanter III with a strong and long dorsobasal spur. Two ventral setae of tarsus IV plumose (Fig. 66).

Material examined: Holotype: Mad-89/49, 11 paratypes from the same sample. Holotype and 6 paratypes: MHNG and 5 paratypes (1411-PO-1991): HNHM.

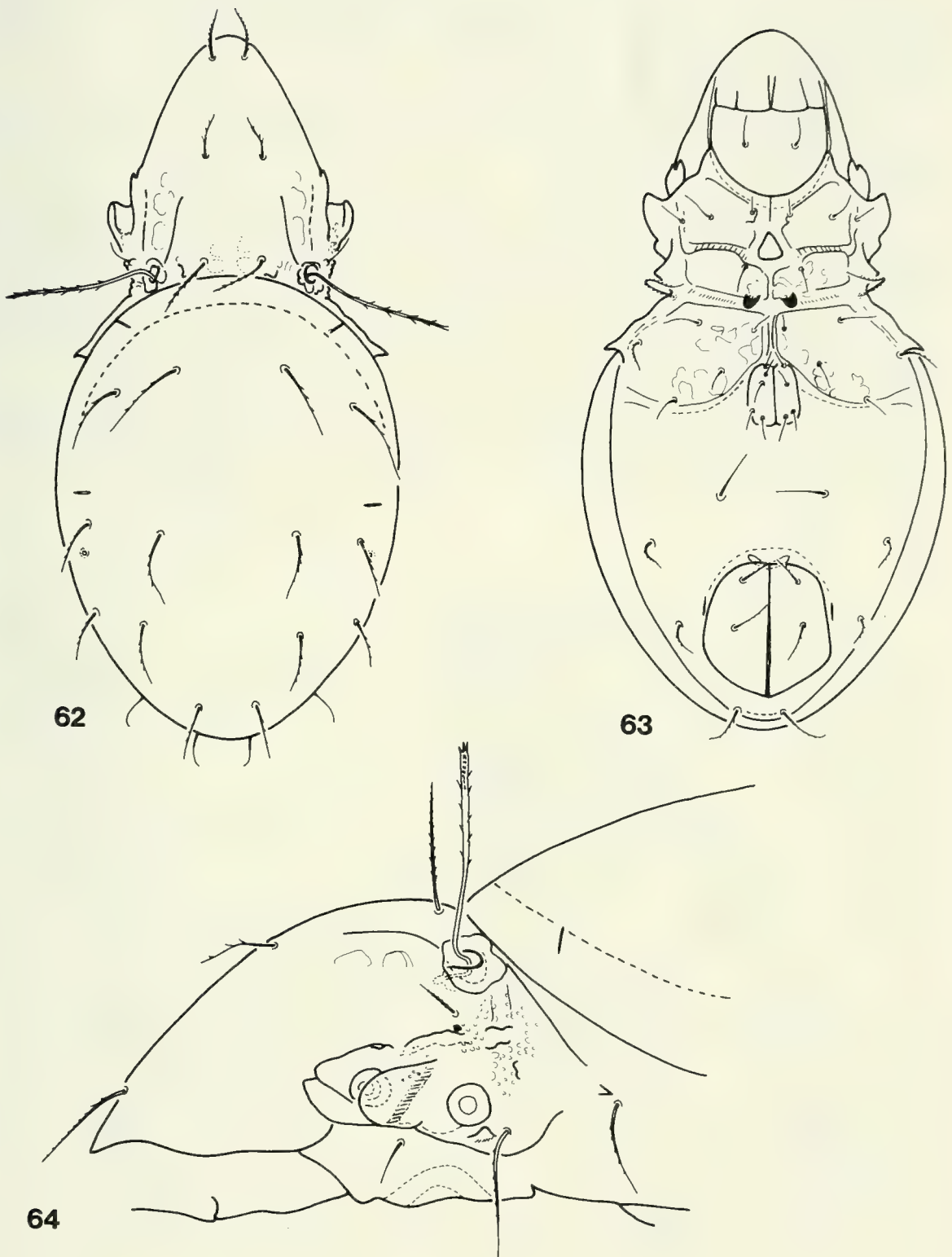
Remarks: The position of this new species is problematic, but it seems to be related to the *Ramusella* genus group. I place it provisionally in the genus *Ramusella* Hammer, 1962. The species is well characterized by the shape of the sensillus and by the shape of the epimeral borders. On this basis it can be distinguished from all congeners.

This species is named after the famous elephant bird (*Aepyornis*), a group of extinct giant birds, endemic to Southern Madagascar.

Striatoppia luisae sp. n.

Measurements. - Length of body: 244-278 μm , width of body: 125-146 μm .

Prodorsum: Rostrum rounded. Lamellae, translamella and prolamellae wide, well developed (Fig. 67). Rostral setae originating on the cuspis of prolamellae, lamellar setae on the translamella. One pair of strong crests in the interbothridial region, between them two pairs of spots visible. The minute interlamellar setae arising outside of these crests. The surface between the prolamellae polygonate, lace-like, lateral part granulate or pustulate. Bothridium with strong condylus posteriorly, standing opposite to the notogastral apophyses. Sensillus sickle-shaped with strong spines arranged in 5-6 longitudinal rows.



FIGS 62-64

Ramusella aepyornis sp. n. - 62: dorsal side, 63: ventral side, 64: podosoma in lateral aspect.

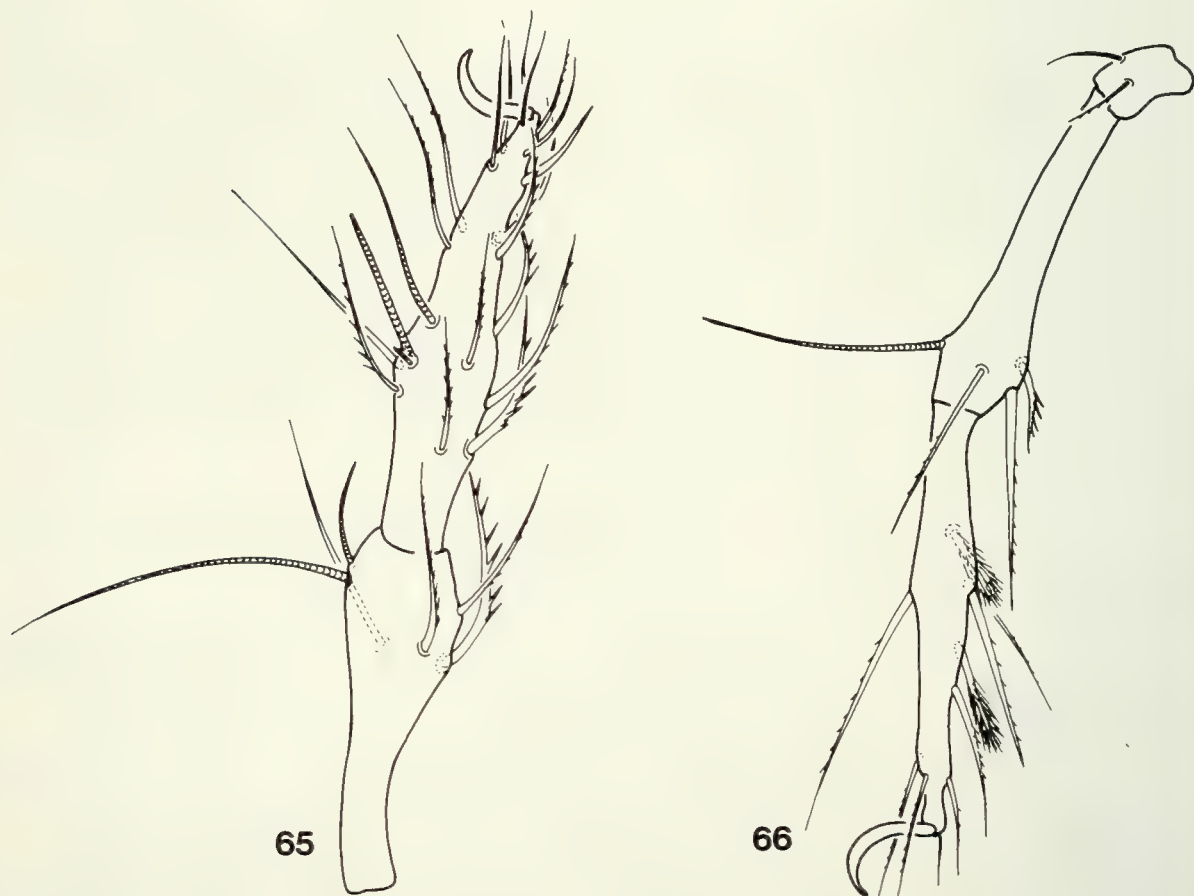
N o t o g a s t e r : Dorsosejugal suture projecting forwards, into a short median apex (Fig. 67). One pair of well developed lateral apophyses present, setae c_2 arising on them. Entire surface reticulate. Ten pairs of wide, phylliform notogastral setae present, their surface spiculate or squamose.

L a t e r a l p a r t o f p o d o s o m a : Whole surface granulate (anteriorly) or pustulate (posteriorly). Pedotecta 1 and discidium well developed, pedotecta 2-3 reduced (Fig. 70).

C o x i s t e r n a l r e g i o n : The whole region with strong, rough sculpture. Epimeral borders well observable, but the anterior part of this region with a median hollow (Fig. 68), epimeral areas not touching medially. Epimeral setae short, simple.

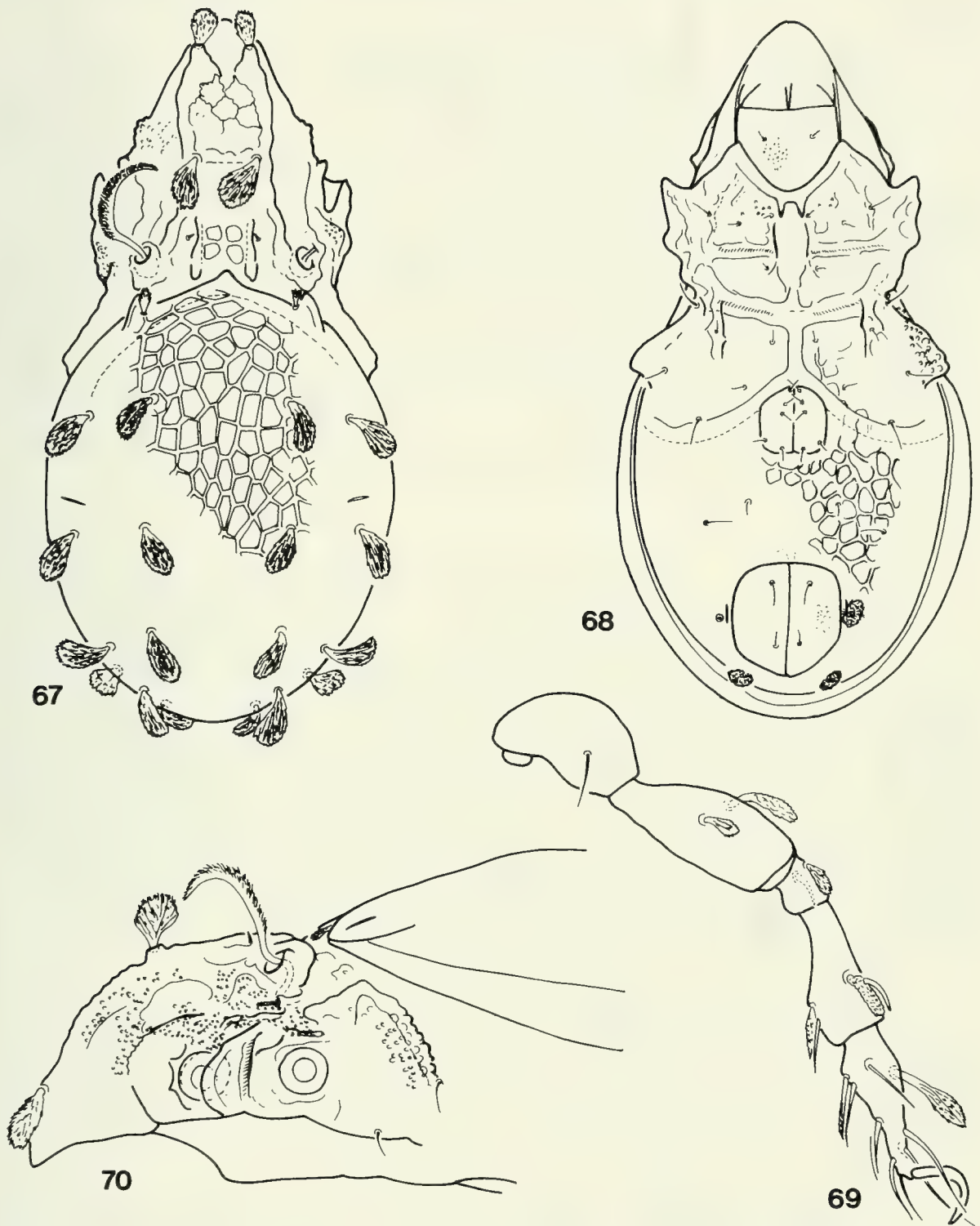
A n o g e n i t a l r e g i o n : Whole surface with reticulate sculpture as notogastral. Anogenital setal formula: 5-1-2-3. Genital, anal and setae ad_3 simple, ad_1 and ad_2 phylliform, similar to the notogastral setae.

G n a t h o s o m a : Palp setal formula: 0-2-1-9+1. All eupathidia conspicuously long, nearly equal in length. Solenidium originating in the basal part of tarsus.



FIGS 65-66

Ramusella aepyornis sp. n. - 65: tibia and tarsus of leg I, 66: genu, tibia and tarsus of leg IV.



FIGS 67-70

Striatoppia luisae sp. n. - 67: dorsal side, 68: ventral side, 69: leg IV, 70: podosoma in lateral aspect.

Legs : All joints of legs with typical phylliform setae (Fig. 69). Their setal formulae:

- I: 1-5-2+1- 4+2-20+2-1
 II: 1-5-2+1- 4+1-14+2-1
 III: 2-3-1+1-3+1-12-1
 IV: 1-2-2-2+1-10-1

Solenidium of tibia I arising on a heavy process. Distal end of tarsal solenidia strongly arched.

Material examined : Holotype: Mad-89/52; 8 paratypes from the same sample; 1 paratype: Mad-89/3. Holotype and 6 paratypes: MHNG and 3 paratypes (1412-PO-1991): HNHN.

Remarks : All heretofore known species of the genus *Striatoppia* Balogh, 1958, have the typical, lineolate sculpture on the notogaster. Accordingly, all congeners are distinguishable from the new species.

I dedicate this new species to my wife for her continuing help and scientific assistance.

Fossoppia gen. n.

Diagnosis : Family *Oppiidae*. Rostrum with a long, spiniform apex. Prodorsum with heavy costulae, interbothridial spots present. Sensillus long, setiform, pectinate. In the sejugal region one pair of large, round foramina observable. Dorso-sejugal suture arching forwards, interrupted medially. Notogastral crista absent. A pair of long, curved spinae adnatae present. Ten to thirteen pairs of long notogastral setae. Pedotecta 1 large, setae *1c* arising on it. Apodemes and epimeral borders weakly developed, partly absent. All epimeral setae long. Anogenital setal formula: 6-1-2-3. Genital-aggenital region with striation. Setae *ad*₁ in post-, setae *ad*₃ in preanal position. Lyrifissures *iad* far from the anal aperture, in direct apoanal or paraanal position. Gnathosoma normal, chelicerae well developed. Legs of normal "oppiid" type, setal formula also of normal type - except tibia III-IV, which have four setae.

Type species : *Fossoppia calcarata* sp. n.

Remarks : The relationship of the new genus is rather problematic. It has a number of particularly interesting features which are inconsistent with the recent system of the family *Oppiidae* (WOAS 1986). But the establishment of a further new subfamily in the deplorably confused situation within the family offers no acceptable solution.

There is no doubt that the two species described below are closely related to each other, though well distinguishable. There are, however, two characteristics which are occasionally used also at the generic level: the notogastral setal number and the position of the lyrifissures *iad*. One of the new species assigned to the new genus bears ten, the other thirteen notogastral setae. In one species the lyrifissures *iad* lie in direct apoanal, in the other in unequivocally paraanal position, although far removed from the anal aperture. In the case of setal numbers BERNINI (1973) already presumed the possibility of variation, even intraspecifically (*O. confinis*) — a problem which needs further studies on a larger series.

Fossoppia calcarata sp. n.

Measurements. - Length of body: 305 μ m, width of body: 162 μ m.

Integument: Whole surface covered by a cerotegument layer with different granules adhering to it. In the rostral, sejugal, abjugal region, around the acetabula and on the posterior end of the notogaster it consists mostly of filaments.

Prodorsum: Rostrum with a narrow, long, sharply pointed median apex (Fig. 73). A pair of strong median costulae connected by a much weaker transcostula present. Behind the bothridium a pair of convergent laths also observable and laterally, near the sejugal region one pair of well framed, round "foramina" observable (Fig. 71). Rostral setae arising laterally far from each other. Exobothridial setae also setiform, lamellar and interlamellar ones pin-shaped. Bothridium angular, sensillus very long, directed outwards, subsequently inwards, unilaterally bearing strong cilia of varying length.

Notogaster: Anterior margin strongly convex, narrowing anteriorly. Long spinae adnatae present on the anterolateral margin (Fig. 71), in front of the lyrifissures *ia*, much shorter but thicker than the notogastral setae. Ten pairs of notogastral setae present, all very long and distinctly ciliate. Lyrifissures *im* located very near to the insertion of seta *lp*.

Lateral part of podosoma: Pedotecta 1 normal, bearing setae *lc*. Pedotecta 2-3 small, discidium very large, but short.

Coxisternal region: Apodemes and epimeral borders reduced, sternal borders and apodemes absent, epimeres mostly opened medially (Fig. 72). In some specimens a weak border observable between epimeres 1. and 2. Epimeral setae very long, all directed inwards and/or forwards.

Anogenital region: Genital plates with 4-5 longitudinal crests, some striation also visible along the genital aperture. Genital setae short, all other setae comparatively long but varying in length, e.g. *ad*₁ much shorter than *ad*₃, *an*₁ shorter than *an*₂. Lyrifissures *iad* in direct apoanal or paraanal position, but far from the anal aperture.

Gnathosoma: Chelicerae (Fig. 76) and palps (Fig. 77) show the normal "oppiid" characters. Palpal setal formula 0-2-1-3-8+1.

Legs: Leg surface ornamented by a fine reticulation. With a few exceptions legs setae are robust and long, distinctly ciliate. Leg setal formulae are:

I: 1-5-2+1- 4+2-20+2-1 (Fig. 74)

II: 1-5-2+1- 4+1-14+2-1

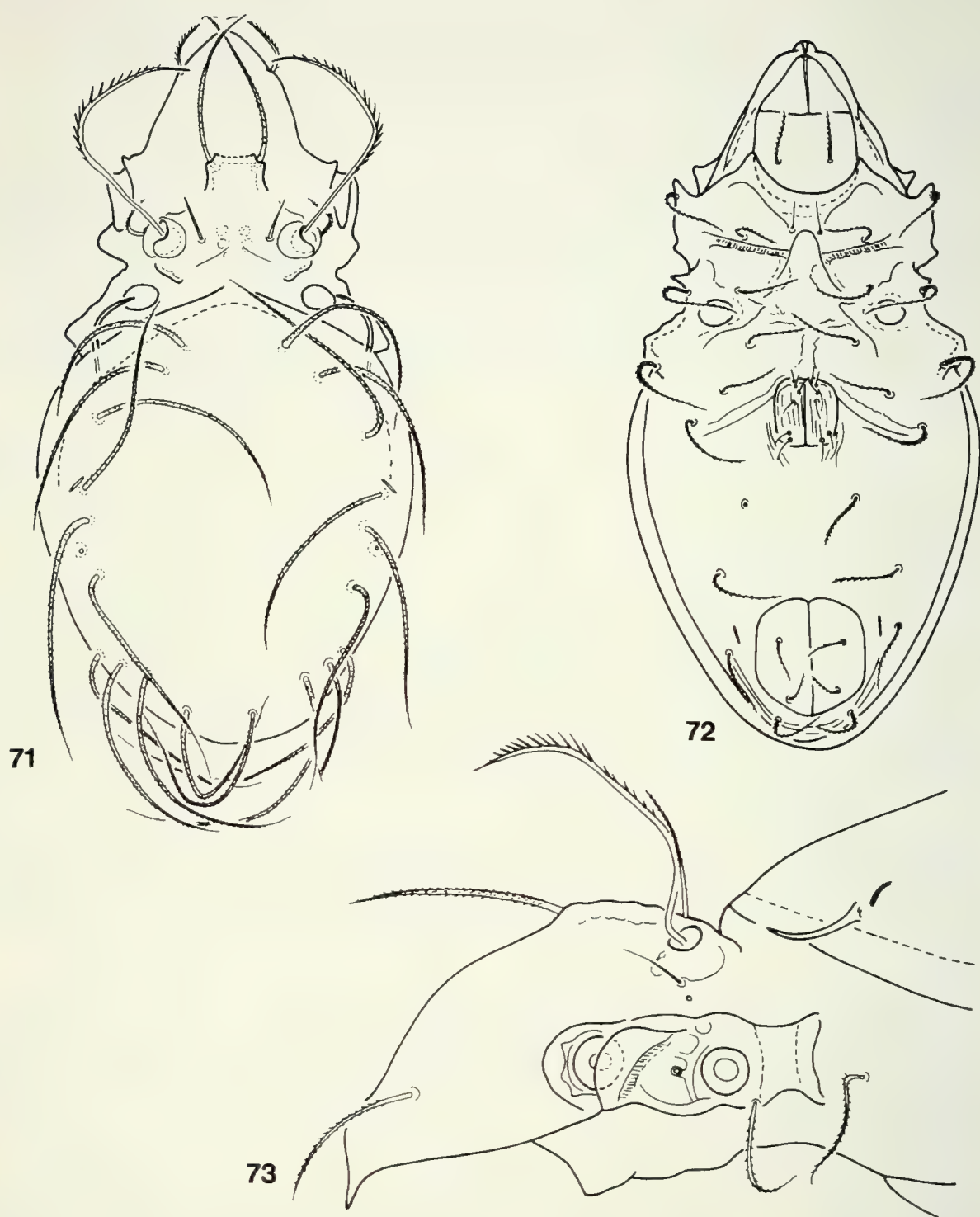
III: 2-3-1+1- 4+1-13-1

IV: 1-2-2-4+1-10-1 (Fig. 75)

These are nearly the typical "oppiid" formulae, but the number of setae on the third and fourth tibiae are unique in the family.

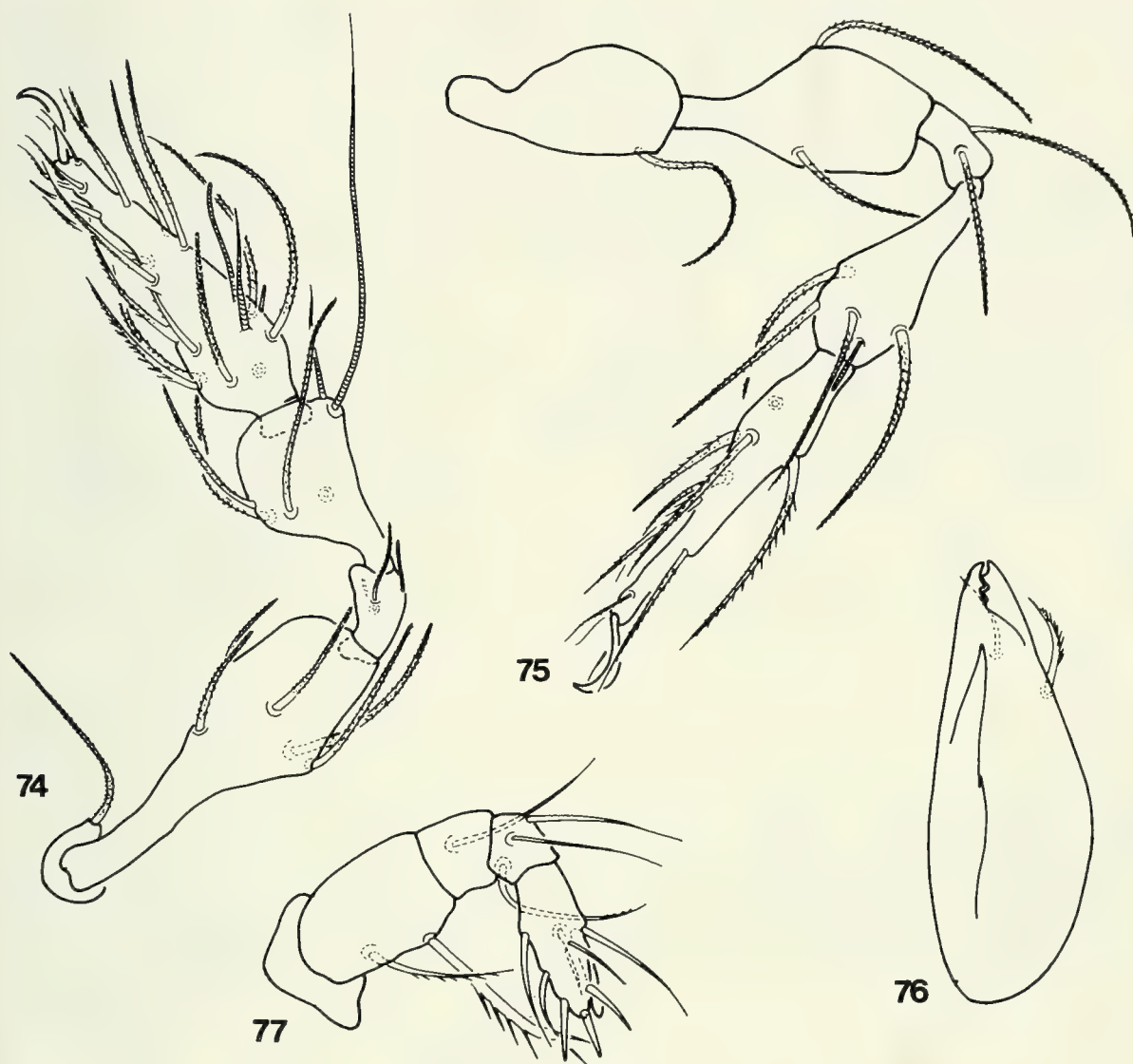
Material examined: Holotype: Mad-89/29: MHNG.

Remarks: See after the next species.



FIGS 71-73

Fossoppia calcarata gen. n., sp. n. - 71: dorsal side, 72: ventral side, 73: podosoma in lateral aspect.



FIGS 74-77

Fossoppia calcarata gen. n., sp. n. - 74: leg I, 75: leg IV, 76: chelicera, 77: palp.

***Fossoppia pirata* sp. n.**

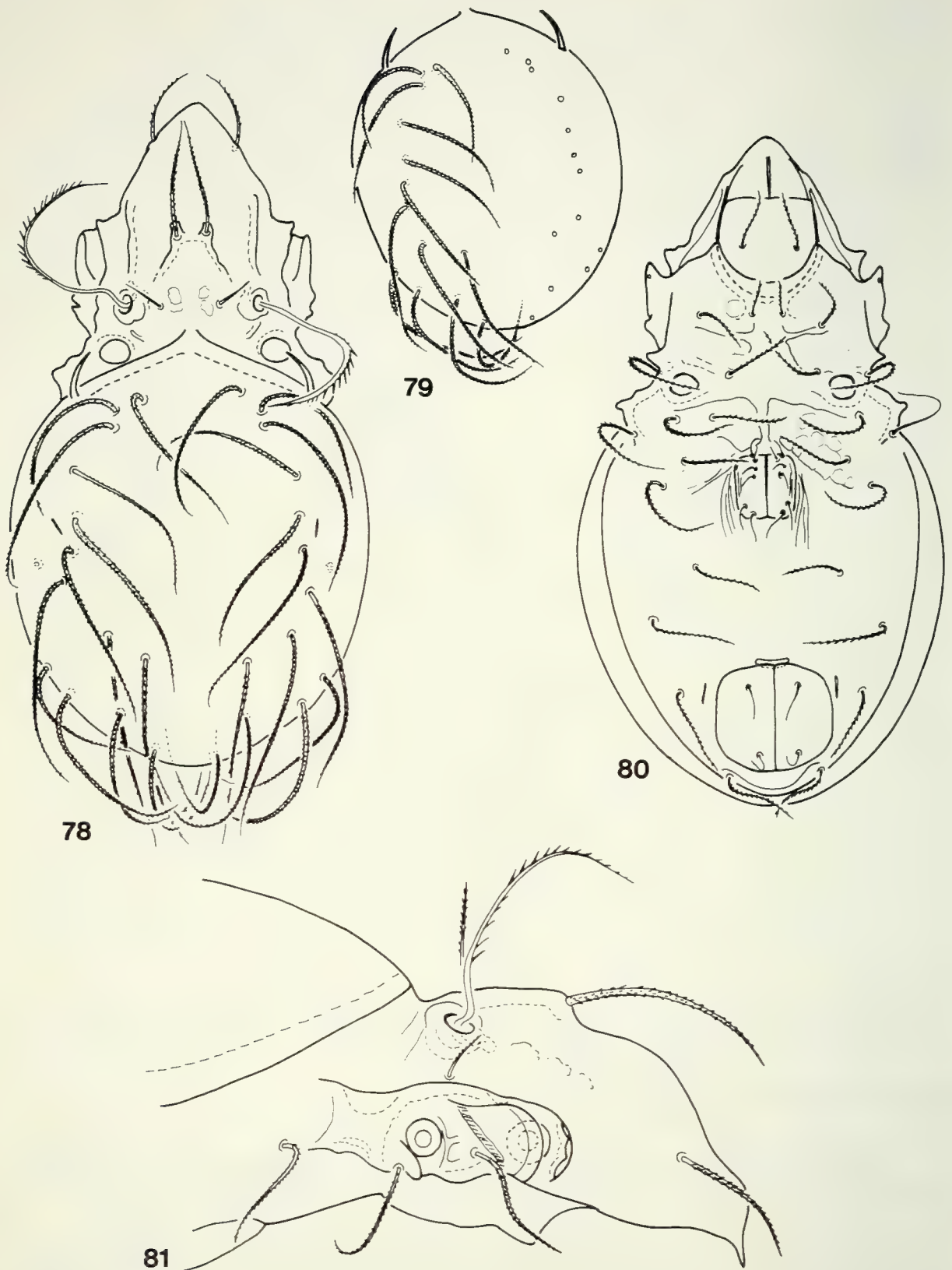
This species is in many respects very similar to the preceding one. Therefore, only the main differential characters are mentioned in the following description.

Measurements: Length of body: 290 μm , width of body: 162 μm .

Prodosum: Lamellar costula continued anteriorly in front of the insertion of the lamellar setae (Fig. 78). Transversal costula clearly interrupted medially. Lamellar setae shorter, not reaching to rostrum (Fig. 81).

Notogaster: Spinae adnatae strong, curved inwards (Fig. 79). Thirteen pairs of very long notogastral setae present.

Coxisternal region: Sternal borders as shown in Fig. 80.



FIGS 78-81

Fossoppia pirata gen. n., sp. n. - 78: dorsal side, 79: chaetotaxy of notogaster, 80: ventral side, 81: podosoma in lateral aspect.

Anogenital region: Genital plates smooth medially, only 1-2 longitudinal striae present laterally.

Gnathosoma and legs: As in the preceding species. Both setae of genu IV very long, well ciliate.

Material examined: Holotype: Mad-89/54, 4 paratypes from the same sample. Holotype and 2 paratypes: MHNG and 2 paratypes (1413-PO-1991): HNHM.

Remarks: The two new *Fossoppia* species can be distinguished as follows:

calcarata sp. n.

1. Costulae short, ending at the insertion of lamellar setae.
2. Lamellar setae long, reaching beyond the apex of rostrum.
3. Ten pairs of notogastral setae present.
4. Surface of genital plates with 5-6 longitudinal striae.

pirata sp. n.

1. Costulae longer, continuing anteriorad after the insertion of lamellar setae.
2. Lamellar setae short, not even reaching the rostral apex.
3. Thirteen pairs of notogastral setae present.
4. Surface of genital plates with 1-2 longitudinal striae.

Nosybelbidae fam. n.

Diagnosis: Superfamily *Oppioidea*. "Oppioid" habitus. Pedotecta 1 and discidium well developed, pedotecta 2-3 absent. Epimeres 3-4 with a strong secondary crest, parallel with the discidium. Suctorial anarthric infracapitulum, rutellum reduced. Chelicerae modified, digiti without teeth, but with two (*cha*, *chb*) setae. Palp with two setae on tibia. Tarsus of all legs short, much shorter than the tibiae. Tibia I with a robust process, solenidia arising on it.

Type genus: *Nosybelba* gen. n.

Remarks: Discussion after the diagnosis of the new genus.

Nosybelba gen. n.

Diagnosis: Rostrum rounded. Prodorsum with a peculiar median structure, lamellar setae arising on it. Three pairs of prodorsal setae present (exobothridial setae represented only by alveoli) and nine pairs of notogastral setae (*c*₂ completely absent). Epimeral region heavily sclerotized, resembling the "suctobelboid" type. Epimeral setal formula: 3-1-3-3. Setae *1c* arising on pedotecta 1. Anogenital setal formula: 4-1-2-3. Setae *ad*₁ postanal, setae *ad*₃ preanal, lyrifissures *iad* in paraanal position. Claw of all legs very strong, legs with nearly normal "oppioid" setal formulae.

Type species: *Nosybelba oppiana* sp. n.

Remarks: The new taxon may be characterized by several features which seem transitional between the *Suctobelbidae*, *Quadropiidae* and *Oppiidae*, but also by some unique characters (e.g. form of mentum and chelicerae, form of tibia and tarsus of leg I). The form of the mentum resembles that of the genus *Quadroppia*, but all other characters (e.g. chaetotaxy of legs) do not correspond to this genus. The insertion of the

new taxon in one of the hitherto known families is not possible, therefore a new genus and a new family is here established.

The first part of the name (Nosy) means "island", in the Malagasy language.

Nosybelba oppiana sp. n.

M e a s u r e m e n t s . - Length of body: 374-399 μm , width of body: 221-246 μm .

P r o d o s u m : Rostrum rounded, rostral setae arising near the rostral apex, on the dorsal surface. Prodorsum with a strong median, nearly horseshoe-shaped costula without connection to the bothridium (Fig. 82). A short lamellar line also observable, decurrent from the bothridium anteriorly. Some median spots (in interbothridial position) and some lateral spots present. Prodorsal setae short and simple. Rostral setae the strongest and longest of all, interlamellar setae very short and exobothridial setae represented only by their alveoli. Sensillus lanceolate, its surface fairly spiculate.

N o t o g a s t e r : Nine pairs of short, mostly equally long notogastral setae, the tenth pair (c_2) is only represented by their alveoli.

L a t e r a l p a r t o f p o d o s o m a : Pedotecta 1 and discidium well developed (Fig. 87). Exobothridial region and a field around the legs II well granulate. This sculpture not extending along leg I.

C o x i s t e r n a l r e g i o n : This region of the "suctobelboid"-type (Fig. 85). The epimeral borders and the apodeme all heavily sclerotized. Sternal apodema thick anteriorly, epimeres 1 and 2 not touching medially. On the epimeres 3 and 4 a characteristic secondary longitudinal crest present.

A n o g e n i t a l r e g i o n : Anogenital setal formula: 4-1-2-3. Setae ad_1 in postanal, ad_3 in preanal position. Lyrifissures iad in adanal position.

G n a t h o s o m a : Suctorial labiogenal articulation (Fig. 83). Chelicerae (Fig. 84) slightly elongate, without teeth either on the digitus fixus nor on the digitus mobilis. Palp (Fig. 86) five-jointed with the following setal formula: 0-2-1-2-7+1 (!).

L e g s : Tarsus of all legs short, much shorter than the tibia, tarsus I (Fig. 88) peculiarly compressed longitudinally. Tibia I with long process, which reaches far over the tarsus. Solenidium ω_2 on tarsus II arising from a small tubercle. Leg setal formulae:

I: 1-5-2+1- 4+2-19+2-1 (Fig. 88-89)

II: 1-5-2+1- 4+1-14+2-1

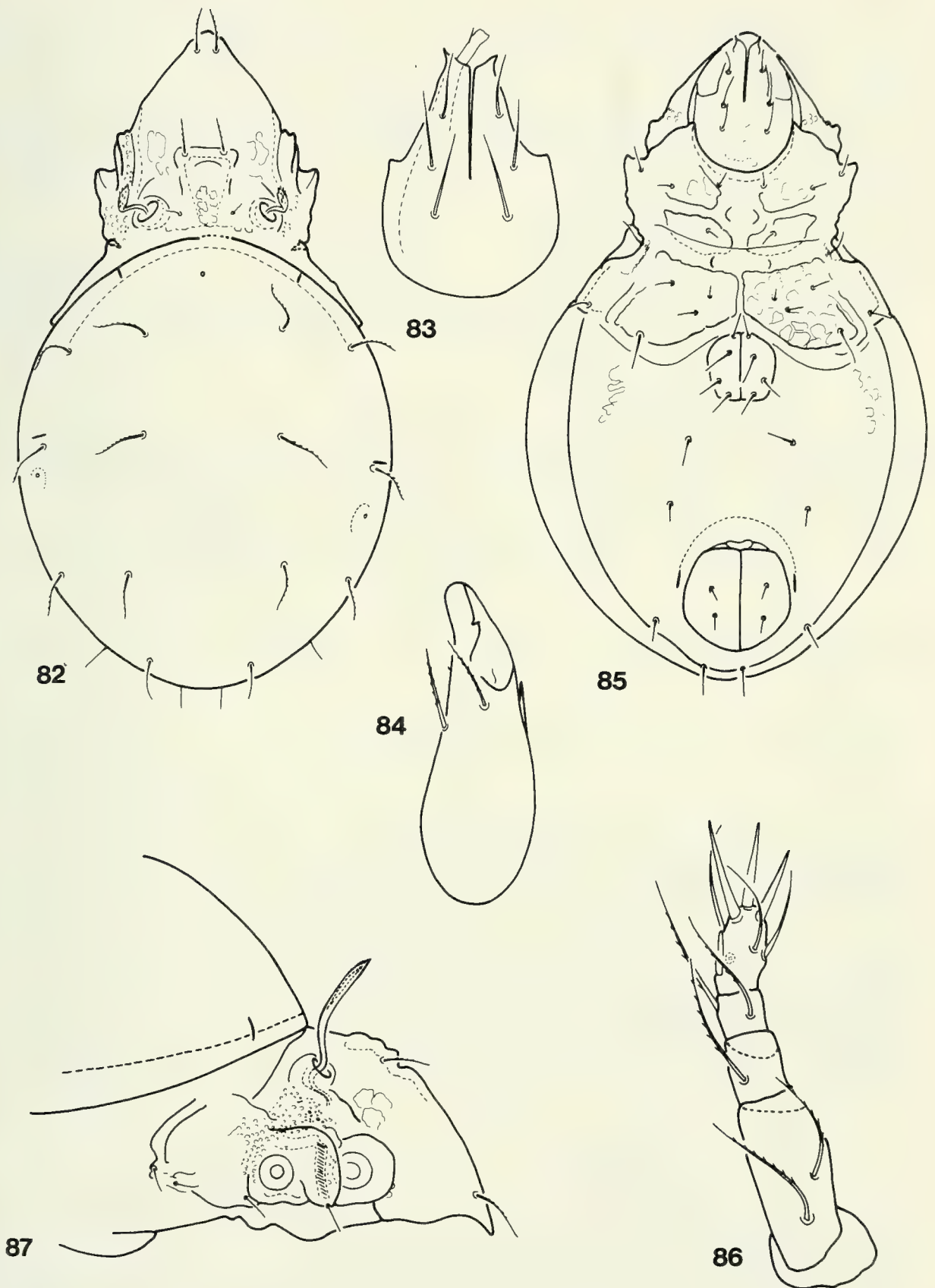
III: 2-3-1+1-3+1-13-1

IV: 1-2-2-3+1-10-1 (Fig. 90)

Setae tc'' on tarsus I absent.

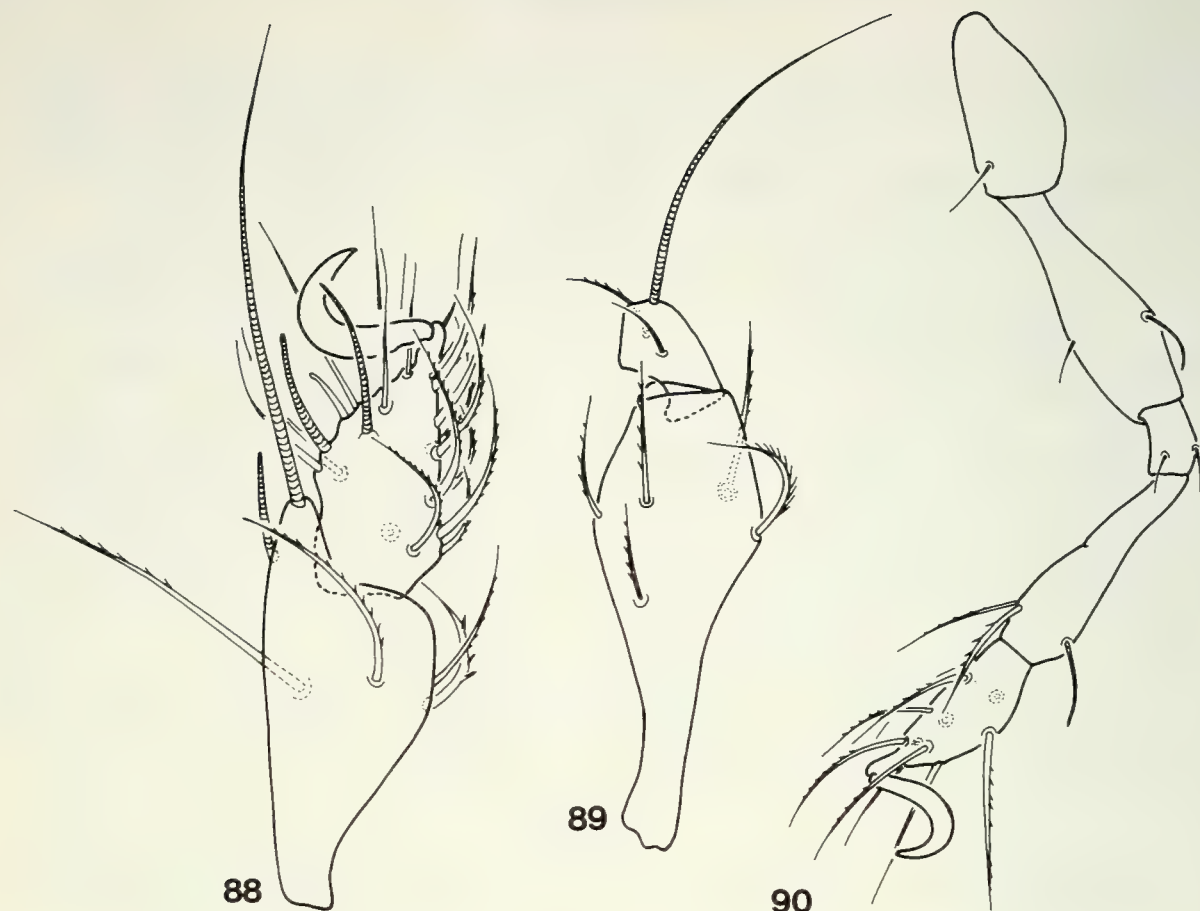
M a t e r i a l e x a m i n e d : Holotype: Mad-89/2, 20 paratypes from the same sample. Holotype and 12 paratypes: MHNG and 8 paratypes (1414-PO-1991): HNHM.

R e m a r k s : See after the generic diagnosis.



FIGS 82-87

Nosybea oppiana gen. n., sp. n. - 82: dorsal side, 83: mentum, 84: chelicera, 85: ventral side, 86: palp, 87: podosoma in lateral aspect.



FIGS 88-90

Nosybea oppiana gen. n., sp. n. - 88: tibia and tarsus of leg I, 89: femur and genu of leg I, 90: leg IV.

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